SESSIONAL PAPERS.

VOLUME XIII.—PART I.

SECOND SESSION OF THE FOURTH LEGISLATURE

OF THE

PROVINCE OF ONTARIO.

Session 1881.

TORONTO
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JORDAN STREET.

LIST OF SESSIONAL PAPERS.

VOL. 13, SESSION 1881.

ARRANGED ALPHABETICALLY.

SESSIONAL PAPERS.

ARRANGED NUMERICALLY.

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No. 20.. Copies of all correspondence between the University of Toronto and any College or Collegiate Institute, respecting affiliation, since 1873.

No. 21.. Report of the Inspector of Insurance for the year 1880.

No. 22.. Classification of Officers, Chief Clerks and Clerks required for the Public Service under Section 20, Cap. 2, 41 Victoria, the Ontario Public Service Act of 1878.

No. 23.. Copy of a Report of the Department of Public Works of the late Province of Canada, dated 3rd April, 1856, on the probable cost of erecting Parliamentary Buildings in the City of Toronto. Report as to any proceedings taken by such Department, or by the Government of the late Province of *Canada*, for the selection of a site for such Parliamentary Buildings in the University Park at the head of the College Avenue, pursuant to the Act 16 Victoria, cap. 161, and for the sale of the lands and water lots mentioned in section 4 of the said Act. A statement shewing the total amount expended for repairs of the Parliamentary and Departmental Buildings, and for rents and repairs of temporary offices since 1st July, 1867. An estimate of the value of the lands and buildings now used for Parliamentary and Departmental Buildings, and an estimate of the probable cost of erecting new Public Buildings for such purposes.

No. 24.. Return from each County and City of the number of days during which the County Selectors were engaged in selection of the July Lists of 1880, giving the date of each sitting, and the number of names selected at each day's sitting, the number of names selected for the different lists, and the total number returned by the municipalities on the Jurors' Rolls; also, the amount paid to the selectors for such selections.

No. 25.. Return shewing the number of Orange Lodges incorporated under the General Act of 1874, and the Revised Act in that behalf; also, what other societies have been incorporated under either of the said Acts, and to obtain from said organization the expenses incurred in securing the incorporation.

No. 26.. Return shewing the names of all the Police Magistrates in Ontario; the amount of salary of each; or, if paid by fees, the amount of such fees; number of cases brought before each for adjudication; the number of convictions; and the amount of fines imposed for the years 1878 and 1879.

No. 27.. Return from the Clerks of the Municipalities and the County Treasurers of the expenses incurred in each Municipality of the Province under the Voters' List Act, shewing the respective amounts paid in each for preparing, printing, publishing, distributing and filing with the Clerks of the Peace, the Voters' Lists; the number of appeals to the Judge's Court, and the expenses attending the hearing and disposal of said appeals and the amounts paid to the several officers of said Courts of Appeal for the years 1878 and 1879: also, all correspondence and accounts that may have passed between the Judges and the Government with respect to the expenses of holding the said Courts of Appeal in these years. *(Not printed.)*

No. 28 . Return shewing the time elapsing between the sentences of the prisoners and their removal to the Central Prison for the years 1879 and 1880, distinguishing those who were tried by the Judges alone at the Interim Sessions from those tried before a Jury. *(Not printed.)*

No. 29 . Return shewing the total number of applications made for loans under the Tile Drainage Act since 1878; the Municipalities by which such applications have been made; the length of drains completed in each Municipality; the kind of drain, whether tile, stone, or wood; the sums actually paid out of the Tile or Under-drainage Fund; the Municipalities to which such payments have been made; the amounts repaid by the different Municipalities, together with the number of persons availing themselves to the utmost limit allowed by the Act of borrowing $1,000 by one individual.

No. 30 . Copies of all correspondence which has taken place between the Executive Council of the Province of Ontario, or any member thereof, and the Privy Council of Canada, or any Member thereof, respecting the award relating to the Boundaries of the Province of Ontario, and respecting the territory in dispute between the Dominion and the Province, and which has not yet been laid before this House.

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No. 35 . Return shewing the amount of the Debenture Indebtedness of each County, City, Town, Township, and Village Municipality in the Province, on 31st December, 1879; for what works or service the said Debentures were issued; the date and amount of the several issues made, and when maturing; the amount paid or redeemed, and the amount of principal still outstanding; the total amount of the Sinking Fund levied and raised to 31st December, 1878, and the investments thereof made to 31st December, 1879; in the case of counties the equalized value, and in other municipalities, the

assessed value of each ; also, the assessed value of each Municipality having such indebtedness, and the rate imposed for all purposes. *(Not printed.)*

No. 36.. Return of all the School-books, authorized and in use in the Public Schools of Ontario on the 1st day of July, 1867, with the retail price in each case. A list of all School-books that have been authorized at different times for use in Public, Grammar and High Schools of Ontario since the above date, specifying the name of the author in each case, together with the retail price of the same. Said last mentioned list to indicate those text-books now authorized and in use ; and, also, those now proposed to be authorized, also copies of all regulations respecting Public School text-books, as well as any data on which the retail prices have been based.

No. 37.. Return of the costs of conveying Lunatics to the Provincial Asylums, or Boys to the Reformatory, from the County Gaols, under Act 43 Vic., chap. 35 ; and, also, the costs of conveying the same classes by the Sheriffs during the years 1878 and 1879, giving the number so conveyed from each County or City, and the cost paid in connection with the conveyance of each Lunatic or Prisoner, the cost under Provincial Bailiff to include the sixty per cent. payable towards salary of Bailiff.

No. 38.. Return respecting the Collegiate Institutes of Ontario, shewing:—

(1) Total number of pupils in attendance at each Institute, and the average attendance during the years 1877, 1878, 1879, 1880.

(2) Number of pupils in each of these years who were preparing for the profession of a Public School Teacher.

(3) Number of pupils who have matriculated during these years at Toronto University.

(4) Number of such matriculants who have matriculated with honours, stating what honours they received.

(5) Names of teachers, also their certificates or degrees, and the salaries paid to them.

(6) Government allowance granted to these Institutes during these years.

No. 39.. Return of all cases now standing for Judgment in the Court of Chancery, which were heard on or before the first day of November, 1880, and shewing the dates of hearing in each case. *(Not printed.)*

No. 40.. Special Report on County Model Schools, 1880, shewing the standing of Teachers, Terms kept open, Attendance, Results of Examinations, Grants from Government and Counties, Fees, etc.

No. 41.. Correspondence and Papers relating to the following Railways :—Stratford and Huron, Georgian Bay and Wellington, and Erie and Huron.

No. 42.. Report of the Ontario Agricultural Commission, the statistical information collected, and the oral evidence taken by the Commissioners. *(Printed for distribution only.)*

No. 43.. Return containing the Minutes of the Senate of the University of Toronto, from the date of the last Return down to close of 1880. *(Not printed.)*

No. 44.. Reports of the Stipendiary Magistrates with respect to the Northerly and Westerly parts of Ontario.

No. 45. Return shewing :—

1st. The number of prisoners committed to the Central Prison, in default of payment of fines imposed by the Toronto Police Magistrate since the opening of that institution.

2nd. The nature of the offences for which each prisoner was convicted and committed on non-payment of fines and fees imposed.

3rd. The amount of fines and fees imposed in each case shewn separately, together with the date of conviction.

4th. The amount of fines and fees paid at said Prison on discharge of such prisoners, and the date of each payment.

5th. The application of such fines and fees so paid, say :—

(1) Amount retained by Government.
(2) Amount paid to Municipality.
(3) Authority for such subdivision, or other application of such fines and fees. *(Not printed.)*

No. 46. Special Report of the Minister of Education on the Mechanics' Institutes.

No. 47. Return shewing, as far as appears from the Records in the Court, the amount of money collected by the Receiver, appointed by the Court of Chancery, to wind up the affairs of the Niagara District Mutual Fire Insurance Company, and how the moneys are disbursed ; also, a complete statement of the assets and liabilities of the Company, so far as known to the Receiver, and as appears by the Records in the Court.

No. 48. Statement of Receipts and Expenditures on account of the Mercer Estate, from 1st of January to the 31st December, 1880.

No. 49. Copies of correspondence between the Government and any person, or persons, referring to the dissolving of Union School Section No. 9½, in the Township of Matilda, and School Section No. 15, in the Township of Williamsburg ; and, also, in reference to the confirmation or quashing of a By-law, passed by the Council of the Township of Matilda, on 3rd of September, 1880, dissolving such Union School Section. *(Not printed.)*

No. 50. Return of all Market Fees and Market Rents received in each City, Town, and Village in Ontario, for the years 1879 and 1880. The amount of salaries paid to Market Clerks and the rates of fees charged.

No. 51. Statement of the Assets, Liabilities, Revenue, Expenditure, etc., of Counties, Cities, and Towns in the Province of Ontario for the year 1879.

No. 52. Return in accordance with the provisions of the Debentures Registration Act, Section 4, Chapter 176, R. S. O., for the year 1880.

No. 53. Return shewing the indebtedness of the Town of Cobourg for principal and interest on account of the Municipal Loan Fund Settlement made in the 1873.

No. 54. Return of all agreements or leases made between the Government of Ontario and any party or parties, relating to rights or privileges on the Niagara River at Clifton or Niagara Falls, shewing rates, rents or sums agreed to be paid, and terms of payment.

No. 55. Return of the number of Bills filed in Chancery, and Writs of Summons issued out of the Superior and County Courts of Common Law in the Province of Ontario in the years 1879 and 1880, respectively. *(Not Printed.)*

PUBLIC ACCOUNTS

OF THE

PROVINCE OF ONTARIO,

FOR THE

YEAR ENDED 31ST DECEMBER,

1880.

Laid before the Legislative Assembly, by Command.

Toronto:
PRINTED BY C. BLACKETT ROBINSON, 5 JORDAN STREET.
1881.

To His Honour the Honourable John Beverley Robinson, Lieutenant-Governor of Ontario.

May it Please Your Honour :

The undersigned has the honour to present to your Honour the Public Accounts of the Province of Ontario for the year ended 31st December, 1880.

Respectfully submitted.

S. C. WOOD,
Treasurer.

Treasury Department, Ontario,
Toronto, January 31st 1881.

PROVINCIAL AUDITOR'S OFFICE,
TORONTO, January 31st, 1881.

To the Honourable S. C. Wood,
Provincial Treasurer.

The undersigned has the honour to present to you the PUBLIC ACCOUNTS for the year 1880.

Respectfully submitted.

C. H. SPROULE,
Auditor.

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EXPENDITURE STATEMENTS.

MISCELLANEOUS STATEMENTS.

No. 1.

RECEIPTS AND PAYMENTS.

BALANCE SHEET, shewing the RECEIPTS AND PAYMENTS of the Treasurer of Ontario during the year 1880, with the Cash Balances on 1st January and 31st December.

RECEIPTS.	$ c.	$ c.	$ c.	PAYMENTS.	$ c.	$ c.	$ c.
To Balance	.....	.....	51,573 03				
CONSOLIDATED REVENUE FUND.				CONSOLIDATED REVENUE FUND.			
From Grammar School Lands	5,027 47			For Civil Government	173,732 67		
" Crown Lands.....	38,867 90			For Colonization Roads	96,839 99		
" Woods and Forests	501,412 17			For Legislation...	111,585 44		
" Casual Fees, etc	12,117 13			For Administration of Justice.....	265,070 31		
" Interest on Investments	101,812 26			For Asylums and other Institutions maintenance.	371,999 83		
" License Fund Account	91,207 68			For Central Prison, maintenance ...	62,069 97		
" Casual Revenue	29,592 91			For Reformatory, Penetanguishene, maintenance....	32,631 10		
" Algoma Taxes	1,863 92			For Mercer Reformatory, maintenance	11,502 21		
" Law Stamps	66,984 00			For Agricultural College	21,987 80		
" Education Department	44,284 27			For College of Technology	5,404 50		
" Public Institutions				For Immigration	52,982 19		
Central Prison	22,390 76			For Agriculture, Scientific and Mechanics' Institutes	107,282 72		
Reformatory	1,491 10						
Mercer Reformatory... .	515 71			For Hospitals and Charities	72,832 63		
Lunatic Asylum, London	6,800 60			For Education	505,104 86		
do Rockwood ..	2,627 09			For Education Refunds	3,252 92		
do Toronto	24,959 60			For Crown Lands Expenditure	59,046 47		
do Hamilton....	2,742 62			For Crown Lands Refunds.....	5,571 87		
do Orillia	966 51			For Miscellaneous	91,293 19		
Deaf and Dumb Institute, Belleville	1,077 00					2,050,196 67	
Blind Institute, Brantford	23 55						
School of Practical Science, Toronto.....	385 00						
		957,182 25					

" Lunatic Asylum, Kingston, Cap. account	8 53		
" Lunatic Asylum, Toronto, Cap. account	9,913 75		
" College of Technology, Cap. acct.	14,363 27		
" Agricultural Farm, Mimico, Cap. account	885 99		
" Central Prison, Cap. account	4,166 66		
" Drainage Works, rent charges	19,734 97		
" Drainage Debentures	34,974 11		
" Tile Drainage Debentures	635 00		
" Settlers' Homesteads	18 00		
" Municipalities *re* M. L. Fund	51,735 35		
" Agricultural College, Guelph Insurance	1,500 01		
" Sale of Bonds	832,472 63		
Stationery Office	788 34		
Amount withdrawn from Special Deposits as per Statement No. 4	783,392 36		
		1,754,588 97	
OPEN ACCOUNTS.			
From Dominion of Canada	1,333,569 42		
" Municipalities Fund	18,613 87		
" Common School Lands	40,243 42		
		1,392,426 71	
			4,104,197 93
Carried forward			4,155,770 96

OPEN ACCOUNTS.			
Asylum for Insane, Toronto	9,895 24		
do London	5,995 16		
do Hamilton	11,632 55		
do Kingston	8,148 70		
do Orillia	2,755 40		
Reformatory, Penetanguishene	25,173 77		
Central Prison, Toronto	1,885 58		
Deaf and Dumb Institute, Belleville	4,338 16		
Blind Institute, Brantford	1,895 88		
School of Agriculture, Guelph	21,797 03		
Educational Buildings, Toronto	1,567 10		
Normal School, Ottawa	23,947 27		
Osgoode Hall, Toronto	1,566 01		
Government House, Toronto	3,815 70		
Parliament Buildings do	178 25		
School of Practical Science	4,292 48		
Parliament Buildings (new account)	4,150 07		
Registry Office and Gaol, Algoma District	65 45		
Court House, Thunder Bay District	650 99		
Registry Office and Lock-up, Parry Sound District	10 60		
Muskoka River Works	7,232 29		
Mary's and Fairy Lakes Works	1,327 79		
Gull and Burnt River Works	7,166 36		
Mercer Reformatory	13,977 78		
Lock-up, Gore Bay	172 62		
Otonabee River Works	1,877 13		
Surveys, Inspections, etc.	1,198 67		
Locks, Dams, etc.	7,573 07		
		171,886 50	
Railway Aid, 41 Vic.	8,765 10		
do Subsidy, 35 Vic	122,347 72		
do Aid, 39 Vic	16,812 56		
do Land Subsidy, 40 Vic.	34,107 10		
Municipalities Fund	14,617 47		
Land Improvement Fund	11,112 97		
Surplus Distribution	22,061 41		
Common School Fund	15,000 00		
Drainage Debentures	41,079 30		
Tile Drainage	10,200 00		
		296,103 63	
			2,518,186 80
Carried forward			2,518,186 80

No. 1.—Balance Sheet, shewing the Receipts and Payments of the Treasurer of Ontario during the year 1880, with the Cash Balances on 1st January and 31st December.—*Continued.*

RECEIPTS.	$ c.	$ c.	$ c.	PAYMENTS.	$ c.	$ c.	$ c.
Brought forward			4,155,770 96	*Brought forward*			2,518,186 80
				Open Accounts.—*Continued.*			
				For Investments, Special Deposits, as per Statement No. 4			1,266,784 71
				Balance in Banks			370,799 45
Total			4,155,770 96	Total			4,155,770 96

Treasury Department, Ontario,
Toronto, January 31st, 1881.

C. H. SPROULE,
Auditor.

No. 2.

OPEN ACCOUNTS.

STATEMENT of the Balance of Open Accounts, December 31st, 1880.

	$ cts.		$ cts.
Ontario Bank	231,521 42	Law Society of Ontario	194,918 07
Bank of Commerce	96,095 89	Consolidated Fund	6,263,217 42
Bank of Montreal	41,338 18	Municipalities' Fund	24,727 82
Consolidated Bank	1,843 96	Common School Lands	983,741 08
Special Deposits—Standard Bank, Ontario	363,392 35	Canada Land and Emigration Society	8,023 41
Do Bank of Commerce	100,000 00	Railway Fund	400,162 35
Do Imperial Bank	100,000 00	Municipal Loan Fund (new account)	1,622,120 03
Dominion of Canada	33,724 81	Drainage Assessment Fund	63,690 66
Investment Account	500,000 00		
Toronto General Hospital	4,000 00		
Drainage Debentures	245,329 29		
Stationery Supply Account	323 75		
Arbitration	24,541 91		
Public Works, Miscellaneous	75,377 06		
Improvement of Navigation, Trent River	2,000 00		
Toronto Lunatic Asylum	244,367 77		
Government House	145,038 17		
Registry Office, Minden	5,534 70		
Parliament Buildings	103,268 79		
Deaf and Dumb Institute	181,934 74		
Surveys and Drainage of Swamp Lands	364,981 41		
Registry Office and Gaol, Muskoka	6,306 62		
Court House and Gaol, Algoma	13,966 23		
Lock, Cameron and Balsam Lakes	28,039 97		
London Lunatic Asylum	599,616 95		
Lock, Rosseau River	36,945 96		
Lock at Young's Point	30,892 72		
Improvement of Navigation, Kaministiquia River	22,865 02		
Cut, Lakes Joseph and Rosseau	9,995 75		
Reformatory, Penetanguishene	67,887 82		
Improvement of Navigation, Sydenham River	2,136 26		
College of Technology	72,297 17		
Scugog River Works	48,923 86		
Agricultural Farm, Mimico	37,048 17		
Agricultural College, Guelph	193,122 53		
Normal and Model Schools, Toronto	56,536 49		
Carried forward	4,091,195 75	*Carried forward*	$9,560,600 84

No. 2.—Statement of the Balance of Open Accounts, 31st December, 1880.—*Continued.*

	$ cts.		$ cts.
Brought forward	4,091,195 75	*Brought forward*	9,560,600 84
Blind Institute, Brantford	177,776 84		
Central Prison	502,122 84		
Improvement of Navigation, Pigeon River	4,999 62		
Improvement of Navigation Nottawasaga River	5,915 09		
Registry Office and Lock-up Parry Sound	5,409 04		
" " Thunder Bay	18,808 59		
Roads in Ryerson	5,886 02		
Muskoka River Works	49,739 20		
Lunatic Asylum, Hamilton	316,405 74		
Normal School, Ottawa	133,188 47		
Lock, Mary's, and Fairy Lakes	34,004 58		
Otonabee River Works	4,397 68		
Portage du Fort Bridge	4,997 99		
Lock-up, Bruce Mines	2,268 79		
Port Carling Bridges	3,046 99		
Washago Road	33,281 34		
Surplus Distribution	3,313,205 71		
Gull and Burnt River Works	51,857 49		
Wye River Works	5,176 98		
Lunatic Asylum, Orillia	43 242 24		
Lock at Lindsay	5,146 31		
Osgoode Hall	20,263 22		
Railway Subsidy Fund, 35 to 37 Vic.	157,878 53		
" Land Account, 40 Vic.	120,008 59		
Tile Drainage Debentures	15,465 00		
Railway Aid Fund, 41 Vic.	31,454 36		
" " 42 Vic.	230,941 71		
Lunatic Asylum, Kingston	145,221 08		
Registry Office and Lock-up, Algoma	8,947 95		
Lock-up, Gore Bay	219 25		
Mercer Reformatory	13,977 78		
Parliament Buildings (new account)	4,150 07		
Total	9,560,600 84	Total	9,560,600 84

C. H. SPROULE,
Auditor.

Treasury Department, Ontario,
Toronto, January 31st, 1881.

No. 3.

STATEMENT of the CONSOLIDATED REVENUE FUND, including the items transferred to it, 31st December, 1880.

1880.	——	$ c.	$ c.	1880.	——	$ c.	$ c.
Dec. 31.	To Expenditure as per Statement No. 1	2,050,196 67			By Balance as per Statement No. 3. 1879	6,034,929 80	
	To Law Society of Upper Canada: For an allowance as equivalent for fees	14,500 00			By receipts as per Statement No. 1	957,182 25	6,992,112 05
	To Land Improvement Fund	11,112 97			*By Municipalities Fund:* For 20 per cent. on amount collected during the year for cost of management		3,722 78
	To Railway Subsidy Fund	100,000 00					
	To Balance	6,263,217 42			*By Dominion of Canada:* Half-year's subsidy and special payment to January 1st	598,436 40	
					Half-year's subsidy and special payment to July 1st	598,436 40	1,196,872 80
					By Dominion of Canada: Half-year's interest on special funds to January 1st	74,847 13	
					Half-year's interest on special funds to July 1st	74,847 14	149,694 27
					By Interest Account: Transfer from Stock and Debenture Account		96,625 16
			8,439,027 06				8,439,027 06

C. H. SPROULE,
Auditor.

TREASURY DEPARTMENT, ONTARIO,
TORONTO, January 31st, 1881.

No. 4.

STATEMENT of the INVESTMENTS made during the year ended 31st December, 1880.

TO WHOM PAID.	NATURE OF INVESTMENT.			Amount.	Total amount.
				$ c.	$ c.
Ontario Bank	Special Deposits bearing interest at 5 per cent			633,392 35	
Bank of Commerce	do	do		533,392 36	
Imperial Bank	do	do		100,000 00	
					1,266,784 71
	Memorandum as to amounts invested				
	Amount of Investments in 1868		$850,000 00		
	do do 1869		705,471 68		
	do do 1871		1,192,333 33		
			$2,747,805 01		
	Less proceeds of sale in 1878	$350,000 00			
	do do 1878	748,857 54			
	do do 1880	1,278,069 78			
		$2,376,927 32			
	Less Commission	$ 2,068 32			
	Accrued Interest due 1st July	30,428 83			
	Transferred to Interest Account	96,625 16			
		129,122 31			
			2,247,805 01		
				(a) 500,000 00	
	Amount of Special Deposits, 31st December, 1879		80,000 00		
	do do made in 1880, as per Statement		1,266,784 71		
			$1,346,784 71		
	Less amounts withdrawn to meet Railway Aid Payments, Surplus Distribution, Current Expenditure, &c., viz. —				
	Ontario Bank	270,000 00			
	Bank of Commerce	433,392 36			
	Consolidated Bank	50,000 00			
	Standard Bank	30,000 00			
			783,392 36		
				563,392 35	

(*a*) Composed of—		
6 per cent. Bonds, purchased 5th June, 1868	$500,000 00	
(*b*) Composed of Special Deposits, now in—		
Ontario Bank	$363,392 35	
Bank of Commerce	100,000 00	
Imperial Bank	100,000 00	
	563,392 35	

C. H. SPROULE,
Auditor.

TREASURER'S DEPARTMENT, ONTARIO,
TORONTO, January 31st, 1881

No. 5.

INTEREST ON INVESTMENTS.

STATEMENT of INTEREST received on account of Investments during the year ending 31st December, 1880.

FROM WHOM RECEIVED.	NATURE OF INVESTMENTS.	$ c.	$ c.
Hon. Receiver-General	Twelve months' dividend on $500,000 6 per cent. Bonds, to 30th September	30,000 00	
Bank of Commerce	Interest on Dominion 5 per cent. Debentures	60,737 49	
		90,737 49	
	Less interest on advance by Bank	21,215 45	
Bank of Commerce	Interest on 5 per cent. special Deposit to 31st December		69,522 04
Ontario Bank	do do	5,701 93	
Standard bank	do do	12,886 76	
Dominion Bank	do do	2,843 90	
Bank of Toronto	do do	16 50	
	do do	7 10	
Bank of Commerce	Interest on Drainage Debentures to 31st December		21,456 19
			10,834 03
			$101,812 26

TREASURY DEPARTMENT, OTTAWA,
TORONTO, January 31st, 1881.

C. H. SPROULE,
Auditor.

No. 6.

LAW STAMPS.

STATEMENT of Revenue received on account of LAW STAMPS during the year ended 31st December, 1880.

COUNTY.	DISTRIBUTOR.	TOTAL.
		$ c.
Brant	G. R. Van Norman	696 35
Bruce	Thos. Dixon	883 50
Carleton	R. Lees	1,800 25
Elgin	Jno. Farley	741 95
Essex	F. E. Marcon	459 80
Frontenac	A. S. Kirkpatrick	1,045 00
Grey	A. Frost	898 00
Halton	Jno. Dewar, Jr.	475 00
Haldimand	J. R. Martin	285 00
Huron	Ira Lewis	1,140 00
Hastings	C. L. Colman	1,337 65
Kent	M. Weir	798 00
Lambton	P. Bucke	546 25
Leeds and Grenville	S. Reynolds, Jr.	717 25
Lennox and Addington	W. A. Reeve	665 00
Lanark	C. Rice	558 60
Lincoln	J. McKeown	1,005 00
Middlesex	C. Hutchinson	2,816 75
Northumberland and Durham	J. W. Kerr	1,330 00
Norfolk	C. C. Rapelje	641 25
Ontario	J. E. Farewell	997 50
Oxford	F. R. Ball	997 50
Peterboro'	C. A. Weller	522 50
Prince Edward	P. Low	264 58
Prescott and Russell	J. W. Marston	190 00
Peel	J. Flemming	416 71
Perth	J. S. Lizars	907 25
Renfrew	H. H. Loucks	303 25
Simcoe	J. R. Cotter	1,129 53
Stormont, Dundas and Glengarry	Jas. Dingwall	855 00
Victoria	A. P. Devlin	902 88
Waterloo	W. H. Bowlby	1,187 50
Wellington	H. W. Peterson	1,149 50
Wentworth	B. B. Osler	2,221 58
Welland	L. D. Raymond	389 50
York	W. Wilcox Baldwin	33,250 00
York Surrogate Courts	Hon. W. Cayley	2,458 60
		$66,984 00

C. H. SPROULE,
Auditor.

TREASURY DEPARTMENT, ONTARIO,
TORONTO, January 31st, 1881.

No. 7.

EDUCATION REVENUE.

STATEMENT of the Receipts of the EDUCATION DEPARTMENT during 1880.

SOURCE.	PARTICULARS.	Amount.	Total.
		$ c.	$ c.
Normal and Model Schools, Toronto	Fees from Model School Pupils	7,939 90	
Do do Ottawa	Do do	1,183 00	
			9,122 90
Superannuated Teachers	Subscriptions during the year		15,816 45
Educational Depository	Sales of Maps, Apparatus, Prizes and Libraries		18,710 40
Educational Museum	Refund of Insurance on Dominion Map		15 00
Departmental Examinations	Money retained on Appeal Cases	366 60	
	Waste paper sold	94 38	
	Refund of express charges on Examination Papers	1 55	
			462 53
Educational Department Expenses	Proceeds of Sales of Postage Stamps	40 24	
	Registration Fee refunded	50	
	Duplicate Certificate sold	25	
			40 99
Miscellaneous	Paid by W. Warwick for right to publish Connor's Etymology	100 00	
	Registers sold	16 00	116 00
	Total		44,281 27

C. H. SPROULE,
Auditor.

TREASURY DEPARTMENT, ONTARIO,
TORONTO, January 31st, 1881.

No. 8.

TAXES ON PATENTED LANDS.

STATEMENT shewing the several amounts received by the Treasurer of Ontario, on account of TAXES ON PATENTED LANDS in the District of Algoma, during the year ended 31st December, 1880.

FROM WHOM RECEIVED.	SERVICE.	$ c.	$ c.
Consolidated Bank	On account of Taxes	53 96	
F. G. Saltonstall	do	46 72	
J. C. Cochrane	do	11 22	
James McGee	do	26 98	
George Ley	do	19 76	
J. M. Heck	do	14 58	
R. Miller	do	82 66	
Quebec Bank	do	57 82	
J. Cattanach	do	4 20	
C. J. Johnson	do	1 30	
Ferguson & Ferguson	do	5 73	
W. J. Murray	do	100 00	
J. G. Murray	do	6 53	
Williams & Murray	do	54 37	
G. Jackson	do	13 88	
S. C. McGill	do	140 75	
G. W. Warner	do	1 78	
J. G. Scott	do	167 70	
W. J. Hadspeth	do	8 52	
G. J. Ferguson	do	12 16	
J. M. Hamilton	Collector of Taxes, Algoma	1,033 30	
			1,863 92

C. H. SPROULE,
Auditor.

TREASURY DEPARTMENT, ONTARIO,
TORONTO, January 31st, 1881.

No 9.

CASUAL REVENUE.

STATEMEFT OF CASUAL REVENUE received by the Treasurer of the Province of Ontario, during the year ended 31st December, 1880.

FROM WHOM RECEIVED.	SERVICE.	$ c.	$ c.
W. Sutton	Sheriff County of Bruce, fines and forfeitures	899 52	
C. Munro	do Elgin, do	67 45	
W. Reynolds	do Ontario, do	1,706 05	
F. W. Jarvis	do York, do	187 15	
G. Taylor	do Hastings, do	227 20	
J. Mercer	do Kent, do	19 00	
W. Patrick	do Leeds and Grenville, do	114 00	
J. D. Merrick	do Prescott and Russell, do	95	
A. McKellar	do Wentworth, do	143 95	
D. McIotyre	do Stormont and Glengarry, do	1 90	
O. T. Pruyn	do Lennox and Addington, do	9 50	
E. Deedes	do Norfolk, do	71 25	
J. McEwen	do Essex, do	1 90	
J. Thompson	do Lanark, do	47 50	
J. Hossee	do Perth, do	4 75	
A. G. Hill	Stipendiary Magistrate, Clifton, fines	385 75	
W. D. Lyon	do do	25 00	
J. Doran	do do	7 00	
S. J. Brown	Justice of Peace, do	10 00	
L. Lawrason	do London, do	1 00	
W. A. Reeve	County Attorney, Lennox and Addington, fines, &c.	10 00	
J. R. Cotter	do Simcoe, fines	14 25	
C. Hutchinson	do Middlesex, do	200 00	
B. B. Osler	do Wentworth, do	2,000 00	
			6,155 07
T. Dixon	do Bruce, unclaimed money, Divison Courts	4 80	
C. Hutchinson	do Middlesex, unclaimed money, D. C.	8 00	
James Stanton	do Elgin, do do	43 26	
			56 06
C. J. Bampton	Registrar, Algoma, on account of fees	202 49	
	Clerk, County of York	4,302 90	
			4,505 30
C. T. Gilmor	Fees received by him for Private Bills	4,061 00	
John Notman	Sale of Ontario Statutes	336 00	
C. B. Robinson	On account of Ontario Gazette	8,236 18	
Hon. D. A. Macdonald	Refund on account of expenditure north-west trip	350 00	
			12,983 18
	Carried forward		23,699 61

No. 9.—*Continued.*

CASUAL REVENUE.

STATEMENT of CASUAL REVENUE received by the Treasurer of the Province of Ontario, during the year ended December 31st, 1880.—*Continued.*

FROM WHOM RECEIVED.	SERVICE.	$ c.	$ c.
	Brought forward		23,699 61
Insurance Companies..	On account of fees		695 50
Hon. Provincial Secretary and Registrar..	49 Commissions, under Great Seal, at $13.00	637 00	
	1 do do at 6.50	6 50	
	51 do Privy Seal, at 8.00	408 00	
	3 Charters of Incorporation, at 60.00	180 00	
	5 do at 50.00	250 00	
	5 do at 40.00	200 00	
	4 do at 30.00	630 00	
	3 do at 25.00	75 00	
	1 do at 20.00	20 00	
	8 do at 10.00	80 00	
	1 Increase of Capital Stock, at 25.00	25 00	
	2 do at 5.00	10 00	
	1 Change of Name, at 25.00	25 00	
	1 do at 20.00	20 00	
	2 Licenses, at 20.00	40 00	
	1 do at 15.00	15 00	
	2 Certificates, at 5.00	10 00	
	85 Judicial Notarial Certificates, at 1.00	85 00	
	14 Superior Court do at 4.00	56 00	
	1 County Court do at 2.00	2 00	
	2 do do at 2.50	5 00	
			2,779 50
	On account of Marriage Licenses		2,703 30
			29,877 91
	Less refund of Estreated Recognizance of A. Campbell, *et. al.*		285 00
			29,592 91

C. H. SPROULE,
Auditor.

TREASURY DEPARTMENT, ONTARIO,
TORONTO, January 31st, 1881.

No

GOVERNMENT

			$ c.	$ c.
1880.				
January 1		Balance, stock on hand, see Public Accounts, 1879, p. 27		1,112 09
	W. Warrick & Son	Supplies	4,158 81	
	W. Barber & Bros	do	2,826 90	
	Buntin, Brother & Co	do	1,441 47	
	W. Thomson & Co	do	1,362 47	
	Brown Bros.	do	640 19	
	Canada Paper Co	do	329 00	
	C. Martin	do	153 65	
	J. Stuart	do	74 00	
	P. Patterson & Son	do	58 16	
	Pim & Holt	do	43 00	
	J. Sale	do	52 50	
	W. Croft & Co	do	24 20	
	Lowden & Co	do	40 00	
	Might & Taylor	do	15 00	
	J. Rose	Cartage	11 10	
	J. Notman	To pay freight	6 53	
				11,236 98
	Total			12,349 07

Treasury Department, Ontario,
Toronto, January 31st, 1881.

10.

STATIONERY OFFICE.

——	——	$ c.	$ c.	$ c.
1880. December 31	Distribution for the year ended 31st December, 1880, charged as follows :—			
	Civil Government—			
	Lieutenant-Governor's office	3 85		
	Attorney-General's Department	289 75		
	Treasury Department	625 37		
	Secretary and Registrar's Office	457 81		
	do do License Branch	116 64		
	Registrar-General's Office	217 68		
	Public Works Department	311 79		
	Crown Lands Department	1,240 87		
	Education Office	382 08		
	Inspector of Prison's Office	291 48		
	Immigration Office	99 57		
	Queen's Printer's Office	63 50		
	Inspector of Division Court's Office	49 61		
	Inspector of Insurance Companies' Office	137 02		
	Agriculture Office	37 23		
			4,324 25	
	Legislation—			
	Stationery	2,064 70		
	Expenses	766 67		
	Library	1 80		
			2,833 17	
	Administration of Justice—			
	Court of Chancery	372 21		
	Court of Queen's Bench	65 98		
	Court of Common Pleas	34 33		
	Court of Appeal	49 78		
	Practice Court	31 88		
	Surrogate Court	3 25		
	Office of Clerk of Assize	10 18		
	District Registration Books	37 00		
			604 61	
	Education—			
	Depository stock	82 20		
	do expenses	190 51		
	Museum	4 88		
	Normal School, Toronto	47 10		
	do Ottawa	155 14		
	Public School Inspection	13 50		
	Departmental Examinations	371 71		
	Miscellaneous	273 51		
			1,138 55	
	Public Institutions, Maintenance—			
	Asylum for Insane, Toronto	107 05		
	do Hamilton	5 00		
	do London	10 15		
	do Kingston	22 40		
	Reformatory, Penetanguishene	107 60		
	Mercer Reformatory	127 42		
	Central Prison	220 83		
	Agricultural College	22 85		
	School of Practical Science	54 48		
	Deaf and Dumb Institute	114 59		
			792 37	
	Agriculture		631 73	
	Miscellaneous—			
	Agricultural Commission		251 39	
	Immigration—			
	Pamphlets		1,449 25	
				12,025 32
	Balance, being stock on hand			323 75
	Total			12,349 07

C. H. SPROULE, *Auditor.*

No. 11.

MUNICIPALITIES FUND.

PAYMENTS.	$ c.	RECEIPTS.	$ c.
To amount paid to the different Municipalities on account of distribution for twelve months, ending 31st December 1879, at the rate of three and a-half cents per head. Details, page 229	14,617 47	By Balance from 1879	24,454 20
		By gross receipts of Crown Lands Department for twelve months, ending 31st December, 1880	18,613 87
To expenses of Management on Receipts, December 31st, 1880	3,722 78		
To Balance	24,727 82		
	43,068 07		43,068 07
		By Balance available for distribution in 1881	24,727 82

C. H. SPROULE,
Auditor.

TREASURY DEPARTMENT, ONTARIO,
TORONTO, January 31st, 1881.

EXPENDITURE STATEMENTS.

No. 12.

STATEMENT of the EXPENDITURE by the Treasurer of Ontario, during the year ended 31st December, 1880.

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	CIVIL GOVERNMENT.				
	LIEUTENANT-GOVERNOR'S OFFICE.				
W. Forsyth Grant	Four months' salary as Private Secretary		400 00		
F. C. Law	Five do do do		500 00		
Gamble Geddes	Six do do do		600 00		
J. B. Macdonald	Six and one-third months' salary as Official Secretary		422 18		
Beverley Robinson	Five and two-third do do do		377 82		
George Hilliar	Twelve months' salary as Messenger		400 00		
				2,700 00	
	DEPARTMENTAL EXPENSES.				
J. B. Macdonald	To pay sundries		448 75		
Gamble Geddes	do do		453 31		
H. C. Dixon	Postage		20 00		
J. Notman	Stationery		3 85		
Montreal Telegraph Co.	Telegrams		21 05		
Dominion do	do		3 04		
				950 00	
	GOVERNMENT HOUSE.				
	EXPENSES.				
T. J. Harris	Services as Gardener and Caretaker		500 00		
George Beasant	do Assistant Gardener		365 00		
Peter Carpenter	do do		350 00		
Thos. Lymer	do as Caretaker		77 00		
Consumers' Gas Co.	Gas Supply	685 51			
P. Burns	Fuel	695 75			
	Carried forward	1,381 26	1,292 00	3,650 00	

CIVIL GOVERNMENT—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	1,381 26	1,292 00	3,650 00	
	GOVERNMENT HOUSE.—*Continued.*				
	EXPENSES.—*Continued.*				
Water-Works	Water	362 00			
T. McConnell & Co.	Wood	107 62			
H. B. Rathbun & Son.	Fuel	1,562 85			
			3,413 73		
T. Berwick & Co	Soap, Brushes, etc.		12 35		
S. May	Repairing Furniture	16 00			
Laird & Roberts	Repairing and Regilding	48 25			
James Adams	Repairing Flags	11 52			
P. Eylward	do Fence	1 88			
Wheeler & Bain	Replating Cutlery	24 71			
W. Rennie	Repairing Garden Implements	3 35			
T. Lalor & Sons	do do do	2 00			
			107 71		
R. Jones	Bricklaying	217 20			
G. & E. Evans	Tinsmithing	550 62			
T. Lalor, jun.	Locksmithing	122 30			
Joseph Murphy	Plastering	68 50			
John Ritchie	Plumbing, etc.	311 98			
H. Paul	Filters	3 60			
J. Kennedy	Ladder	7 00			
			1,281 20		
P. Paterson & Son	Hardware, etc.		77 00		
R. Hay & Co.	Furniture	2 30			
Mason & Risch	Furnishings	2 00			
			4 30		
J. B. Smith.	Lumber		71 86		
L. Glynn	Cleaning snow, etc.	76 88			
G. Duthie	do do	27 00			
W. Dossor	do chimneys	7 75			
Sundry persons	House cleaning	66 50			
H. Williams	Cleaning carpets, etc	51 88			
D. W. Smith.	do curtains	32 94			
Mary Hilliar.	Cleaning	27 00			

Kate Armstrong	do	18 00		
Margaret Summers	do	18 00		
Margaret Ealbard	do	17 50		
Rees' Wharf Co.	Gravel	4 50	343 45	
J. A. Simmers	Garden implements	54 15		
James Fleming	Plants, etc.	52 80		
T. J. Harris	Garden sundries	28 60		
John Paxton	Potting soil	35 00		
D. J. Hunt	Plants	76 80		
William Lightfoot	do	19 80		
Beadle, Buchanan & Slight	do	8 00		
John Davis	Flower pots	89 55		
John Ryan, sen	Cartage		369 50	
Telephone Co.	Rent of box		124 00	
Sundry Newspapers	Advertising fuel		7 60	
			12 20	
				7,116 30

EXECUTIVE COUNCIL AND ATTORNEY-GENERAL'S OFFICE.

Departmental Salaries.

Hon. O. Mowat	Twelve months' salary as Attorney-General and Premier		5,000 00	
J. G. Scott	do do Deputy of Attorney-General and Clerk of Executive Council		2,800 00	
J. L. Capreol	Twelve months' salary as Assistant Clerk of Executive Council		1,000 00	
William O'Neill	Salary as Secretary (part)		383 32	
J. R. Cartwright	do do		800 00	
S. T. Bastedo	do do		16 68	
E. H. T. Heward	Twelve months' salary as Clerk		650 00	
M. Currey	do do		500 00	
C. A. Fitch	do do Messenger		200 00	
				11,350 00

Departmental Expenses.

Montreal Telegraph Co.	Telegrams	75 40		
Dominion do	do	45 38		
H. Dixon	Postage Stamps	203 00		
			323 78	
C. B. Robinson	Printing	56 86		
William Warwick & Son	do	126 73		
			183 59	
Woodward, Grant & Co	Stamping paper, etc.	16 25		
Grant, Barfoot & Co.	Embossing	12 50		
			28 75	
	Carried forward		536 12	22,116 30

CIVIL GOVERNMENT.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward ...		536 12	22,116 30	
	EXECUTIVE COUNCIL AND ATTORNEY-GENERAL'S OFFICE. *Continued.*				
	DEPARTMENTAL EXPENSES. *Continued.*				
J. Notman	Stationery	289 75			
Brown Brothers	Blotting paper and pads	8 15	297 90		
Hart & Rawlinson	Books for Library	27 50			
Carswell & Co.	do	269 65			
Rowsell & Hutchinson	do	22 60			
E. H. Smith	do	1 10			
Willing & Williamson	do	9 75			
S. J. Watson	do	2 00			
Belford, Clarke & Co	do	3 00			
W. R. Scott	do	5 00	340 60		
H. J. Morgan	Dominion Register	10 00			
Might & Taylor	Directories	5 00			
W. J. Dickson	Almanacs	1 80	16 80		
Consumers' Gas Co.	Gas	19 70			
Toronto Water-Works	Water	15 00			
W. Burns & Co.	Ice	3 00			
P. Burns	Fuel	97 59			
T. McConnell & Co.	Wood	42 13			
H. B. Rathbun & Son	Fuel	139 90	317 32		
Mrs. Crawford	Rent	500 00			
Joseph Murphy	Plastering	10 50			
J. B. Smith	Lumber	5 46			
Cuming & Wells	Plumbing, &c.	14 10			
R. Jones	Bricklaying	6 00			
George E. Evans	Fitting up stoves	18 97	555 33		
James Good	Repairing stove	9 25			
J. E. Ellis & Co.	Repairing clock	2 00			
Pim & Holt	Repairing printograph	6 25	17 50		

Berwick & Co.	Matches, &c	3 60			
N. Connolly	Soap, &c.	3 05			
B. H. Palmer	Mop	1 00			
R. Walker & Son	Carpet-felt	4 20			
J. W. Gale	Furnishings	5 75			
Henry Graham & Co	Carpeting	11 32			
Petley & Co	Matting, &c.	25 97			
Brown Bros	Baskets	2 70			
J. Ryan	Deed box	2 50			
			60 29		
G. Harman	Copy of judgment	1 80			
J. L. Lount	Abstract of title	2 31			
Registrar, Toronto	Registration fees	5 45			
			9 56		
Hon. O. Mowat	Expenses to Ottawa		23 00		
D. H. Doust	Lithograph	3 50			
Hart & Rawlinson	Lithogram	9 00			
Cameron, Amberg & Co.	Letter files	115 75			
F. Shepard	Book labels	1 50			
			129 75		
M. Smith	Office cleaning	130 08			
T. Collins	Cleaning stoves	6 12			
J. M. Hopkins	Cleaning chimneys	1 50			
J. O'Malley	Laying carpet	1 00			
M. Roach	Cutting wood	15 00			
H. Clark	do	4 02			
D. Castor	Sharpening saw	50			
H. Williams	Cleaning carpets	2 66			
J. H. Samo	Upholstering	8 40			
			169 28		
Sundry persons	Cab-hire		28 40		
S. O'Neill	Cartage	1 25			
J. G. Scott	To pay express, &c.	16 68			
			17 93		
M. Roach	Services as fireman	81 50			
M. Smith	Services as housekeeper	250 00			
			331 50		
Sundry newspapers	Subscription and advertising		173 89		
Collector of Customs	Customs duties		43 94		
				3,069 11	
	EDUCATION OFFICE.				
	SALARIES.				
Hon. Adam Crooks	Twelve months' salary as Minister of Education		4,000 00		
J. G. Hodgins	do do Deputy do		3,000 00		
Alexander Marling	do do Secretary of Education		2,000 00		
	Carried forward		9,000 00	25,185 41	

CIVIL GOVERNMENT.—*Continued.*

To whom Paid.	Service.	$ c.	$ c.	$ c.	$ c.
	Brought forward		9,000 00	25,185 41	
	EDUCATION OFFICE.—*Continued.*				
	SALARIES.—*Continued.*				
F. J. Taylor	Twelve months' salary as Chief Clerk and Accountant		1,200 00		
J. T. R. Stinson	do do Clerk		1,000 00		
W. H. Atkinson	do do do		900 00		
H. Alley	do do do		1,100 00		
F. N. Nield	do do do		550 00		
F. J. Griffin	do do do		700 00		
S. B. Sykes	Four do do		183 33		
A. C. Paull	Twelve do do		600 00		
J. H. J. Kerr	do do do		575 00		
S. H. Sykes	Six do Junior Clerk		421 00		
C. J. Townsend	do do do		331 00		
H. P. Davis	do do do		175 00		
J. Davison	do do do		175 00		
B. Hoch	Twelve do do		300 00		
W. J. Graham	do do Caretaker		500 00		
				17,716 33	
	EXPENSES.				
Wm. Warwick & Son	Binding	107 08			
C. B. Robinson	Printing	250 89			
Hunter, Rose & Co.	Copies of school law	43 77			
James Greene	Printing	35 00			
			436 71		
Consumers' Gas Co	Gas	95 03			
W. Burns & Co.	Ice	6 00			
T. McConnell & Co.	Wood	30 00			
H. B. Rathbun & Son	Fuel	200 00			
			331 03		
Postmaster	Postage	10 48			
A. Piddington	Postage stamps, etc	435 32			
H. C. Dixon	do	73 00			
J. G. Hodgins	do	15 78			
			534 58		

Dominion Telegraph Co.	Telegrams	22 30				
Montreal Telegraph Co.	do	28 28				
				50 58		
H. Graham & Co.	Carpeting and matting	68 01				
R. Hay & Co.	Furniture	116 60				
W. H. Sparrow	Furnishings	13 10				
W. H. Rice	Fender	6 00				
C. T. Whitmough	Furnishings	29 65				
P. Paterson & Son	Locks, etc.	2 40				
				235 76		
J. H. Samo	Repairing furniture			2 00		
Copp, Clark & Co.	Books	10 72				
Hart & Rawlinson	do etc.	30 65				
Maclear & Co.	do	2 00				
Wm. Warwick & Son	do	4 25				
R. Wilkinson	Books	2 50				
McLean, Roger & Co.	do	2 50				
John Labbocks	do	2 75				
Might & Taylor	Directories	10 00				
				65 37		
J. S. Laurie	Special report re English elementary system			147 23		
Brown Bros.	Letter balance, etc.	4 25				
George Ringham	Speaking tube, etc.	12 06				
Rice, Lewis & Son	Hardware	10 80				
Hillock & Kent	Lumber	3 45				
W. Hewitt & Co.	Hardware	2 02				
J. P. Wagner & Co.	Lumber	5 53				
George Clatworthy	Sash regulators	1 75				
				39 86		
Ritchie & Co.	Plumbing	254 54				
Hugh Brimstin	Locksmithing	31 23				
Smith & Walsh	Plastering	9 50				
R. H. Lear	Plumbing	14 11				
W. J. McCleary	Carpentering	40 62				
				350 00		
G. Duthie	Clearing snow	15 00				
Hugh Miller	Sponge, soap, etc.	12 20				
W. H. Sparrow	Oil	1 00				
				13 20		
C. Page & Sons	Towelling	8 25				
J. & G. Strathern	Ironware	1 70				
W. St. Croix	Pole	1 50				
				384 43		
J. Notman	Stationery	382 08				
J. Farthing	Repairing electric pen	1 10				
Davis & Co.	Electric pen furnishings	1 25				
				14 40		
A. Horton	Reporting	44 20				
C. Verral	Cab hire					
		44 20		2,631 63		42,901 74
	Carried forward					

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	41 20	2,631 63	42,901 71	
	EDUCATION OFFICE.—*Continued.*				
	EXPENSES. *Continued.*				
Sundry persons	Cab-hire	18 95			
			63 15		
Sundry newspapers	Subscriptions and advertisements		263 22		
William H. Wilkinson	To pay freight, express, etc.	49 52			
Express Co.	Charges	16 69			
Collector of Customs	Customs charges	4 20			
			70 41		
Hon. A. Crooks	Travelling expenses		10 00		
				3,038 41	
	CROWN LANDS DEPARTMENT.				
	DEPARTMENTAL SALARIES.				
Hon. T. B. Pardee	Twelve months salary as Commissioner		4,000 00		
T. H. Johnston	do do Assistant Commissioner		2,800 00		
Geo. Kennedy	do do Law Clerk		1,800 00		
Thos. W. Gibson	Four and one-half months' salary as Shorthand writer and clerk		371 60		
Pedro Alma	One months' do do do		70 83		
	LAND SALES AND FREE GRANTS BRANCH.				
A. Kirkwood	Twelve months' salary as Chief Clerk		1,700 00		
J. M. Grant	do do Clerk		1,250 00		
J. J. Murphy	do do do		1,000 00		
P. Alma	do do do		850 00		
Julian Sale	do do do		750 00		
	SURVEYS, PATENTS AND ROADS BRANCH.				
G. B. Kirkpatrick	Twelve months' salary as Chief Clerk		1,500 00		
W. Revell	do do Clerk		950 00		
Edward Fox	do do Chief Clerk of Patents		1,400 00		

A. J. Taylor	do	do	Clerk		1,200 00	
J. W. Bridgland	do	do	Superintendent, Colonization Roads		1,800 00	
C. Cashman	do	do	Clerk		1,000 00	
			WOODS AND FORESTS BRANCH.			
G. W. Cowper	Twelve months' salary as Chief Clerk				2,000 00	
J. A. Macinnis	do	do	Clerk		1,200 00	
H. G. Langlois	do	do	do		850 00	
E. G. Kirby	do	do	do		700 00	
			ACCOUNTS BRANCH.			
Wm. Ford	Six months' salary as Accountant				1,000 00	
D. G. Ross	Twelve months' salary as Book-keeper				1,250 00	
R. H. Browne	do	do	Clerk		1,250 00	
E. Leigh	do	do	do		750 00	
J. Morphy	do	do	Registrar		1,600 00	
C. P. Higgins	do	do	Clerk		850 00	
J. Bradshaw	do	do	House-keeper		500 00	
A. McDonald	do	do	Messenger		500 00	34,891 83
			EXPENSES.			
Dominion Telegraph Co	Telegrams			16 32		
Montreal do	do			127 97		
A. McDonald	Postage			670 00		
					814 29	
W. Warwick & Son	Binding, etc			570 40		
C. B. Robinson	Printing			442 36		
Jno. Notman	Stationery			1,240 87		
H. H. Paull	Copying Ink			0 75		
					2,254 38	
Might & Taylor	Directories			12 50		
J. Bowman	Books			15 00		
Wesleyan Book Room	Books			5 00		
F. H. Smith	Book			1 00		
W. Ford	Book			1 00		
J. Sale, Jr	Mounting maps			3 60		
S. E. Roberts	Framing do			7 25		
					45 35	
W. H. Sparrow	Dusters			5 60		
J. Robertson & Co	Towelling			6 00		
P. Paterson & Son	Hardware			6 83		
					18 43	
	Carried forward				3,132 45	80,831 98

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		3,132 45	80,831 98	
	CROWN LANDS DEPARTMENT. *Continued.*				
	EXPENSES. *Continued.*				
Wm. Milligan	Painting, glazing, etc	5 15			
D. Forbes	Repairing roof	75 00			
Robert Jones	Bricklaying	21 88			
C. J. Whitehead	Fire brick	6 09			
S. Phillips	Whitewashing	105 00			
			213 33		
Toronto Water-Works	Water	181 33			
J. C. Graham	Ice	24 00			
P. Burns	Fuel	179 90			
H. B. Rathbun & Son	do	514 78			
T. McConnell & Co	Wood	96 89			
			996 90		
W. J. Whitten & Co	Tinsmithing, etc	55 93			
T. Labor, jr	Locksmithing, etc	17 30			
Cuming & Wells	Plumbing	14 04			
C. Carnegie	Repairing clocks	1 50			
			88 77		
R. Hay & Co	Furniture, etc	100 45			
H. Graham & Co	Hearth rugs, matting, etc	10 00			
Pim & Holt	Printograph	9 75			
Kenyon Stewart Manfg. Co.	Stamp	2 00			
C. Potter	Drawing pens	5 00			
Rolph, Smith & Co	Steel die	7 00			
Thos. Mann	Paper stand	5 00			
			139 20		
Rees' Wharf Co	Gravel		2 00		
A. Werden	Coal oil	13 22			
W. A. Bradshaw	Soap, etc	17 20			
			30 42		
G. Duthie	Clearing snow	10 00			
J. Malloy	do	33 30			
J. Bradshaw	Office cleaning	232 90			
W. Watson	do	1 75			

W. R. Dossor	Cleaning chimneys	4 80		
			285 75	
Express Co	Charges	3 10		
G. Verral	Cab-hire	52 75		
Sundry persons	do	2 00		
			57 85	
Sundry Newspapers	Subscriptions and advertising	295 80		
Rowsell & Hutchison	do to law reports	8 24		
			304 04	
J. C. Tarlatt	Services as Chief Clerk, sales branch	166 66		
E. F. Stowe	do extra do	732 00		
W. F. Lewis	do do do	850 00		
J. Waddell	do do do	150 00		
R. Burroughes	do fireman	549 00		
D. Kinnan	do night-watchman	418 75		
F. Frank	do do	1 25		
			2,867 66	
P. Scully	Services on grounds	176 67		
J. Sinuser	do do	156 00		
			332 67	
J. D. Edgar	Law costs		380 20	
Bank of Toronto	Protest costs		1 28	
G. F. Harman	Copy of judgment		5 40	
				8,862 92
	PUBLIC WORKS DEPARTMENT.			
	Departmental Salaries.			
Hon. C. F. Fraser	Twelve months' salary as Commissioner		4,000 00	
Kivas Tully	do do Architect		2,200 00	
Robert McCallum	do do Engineer		1,500 00	
Wm. Edwards	do do Secretary of Public Works		1,750 00	
F. T. Jones	do do Law Clerk		400 00	
R. Purdom	do do Draughtsman		939 00	
W. J. S. Holwell	Seven months' salary as do		547 75	
R. P. Fairbairn	Twelve months' salary as Assistant Draughtsman		700 00	
M. Wilson	do do First Clerk		850 00	
J. P. Edwards	do do Accountant and general Clerk		800 00	
S. G. O'Grady	do do Clerk and Paymaster		700 00	
Samuel Cleary	do do Carpenter		624 00	
C. A. McDonald	do do Messenger		450 00	
				15,460 75
	Departmental Expenses.			
Consumers' Gas Co	Gas	19 69		
Water-Works	Water	15 00		
	Carried forward	34 69		105,130 65

CIVIL GOVERNMENT. *Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	31 69		105,130 65	
	PUBLIC WORKS DEPARTMENT. *Continued.*				
	EXPENSES.—*Continued.*				
Burns & Co	Ice	3 00			
T. McConnell & Co	Wood	42 12	37 69		
W. B. Rathbun & Son	Fuel	139 90			
			182 02		
Mrs. Crawford	Rent		500 00		
Montreal Telegraph Co	Telegrams	48 31			
Dominion Telegraph Co	Telegrams	11 96			
H. C. Dixon	Postage Stamps	150 00			
T. C. Patteson	Rent of P. O. Box	12 00			
			222 27		
Charles Potter	Instruments, etc	39 75			
M. Connolly	Brooms, matches, etc	4 60			
P. Paterson & Son	Hardware, etc	11 50			
Campbell & Co	Filter	1 75			
			57 60		
Petley & Co	Matting, etc	25 98			
J. W. Gale	Window blinds	74			
			26 72		
Kenyon-Stewart Mf'g Co.	Type, ink, pads, etc	2 80			
S. G. O'Grady	Inkstand	60			
B. H. Palmer	Mops	1 00			
Pim & Holt	Printograph	14 00			
			18 40		
C. B. Robinson	Printing	145 24			
W. Warwick & Son	Binding, etc	91 95			
J. Notman	Stationery	311 79			
Brown Brothers	Stationery	1 70			
James Alexander	Paper fasteners	1 20			
			551 88		
Sundry Newspapers	Subscriptions and and advertising	84 89			
Hart & Rawlinson	"Scientific American"	8 50			
F. A. Boxer	Reference Books	4 00			
			97 39		

M. J. Stenson	Services as extra clerk	272 00		
M. Roach	Services as fireman	96 50		
M. Smith	Services as housekeeper	250 00		
H. Clarke	Cutting wood	4 03		
			622 53	
Cuming & Wells	Plumbing	9 51		
G. & E. Evans	Tinsmithing	18 98		
James Good	Repairing stoves	9 25		
E. Becket	Repairing press	1 25		
			38 99	
Robert Jones	Bricklaying	3 00		
Joseph Murphy	Plastering	6 50		
J. B. Smith	Lumber	11 25		
			20 75	
M. Smith	Office cleaning	170 64		
T. M. Hopkins	Cleaning chimneys	1 50		
T. Collins	Cleaning stoves, etc	6 13		
J. E. Ellis & Co	Care of clocks	2 00		
			180 27	
W. H. Irwin	Directory	2 50		
Might & Taylor	Directories	5 00		
J. T. Robinson	Railway guide	1 00		
W. J. Dickson	Almanacs	2 40		
			10 90	
G. Verral	Cab-hire	39 50		
Sundry Persons	do	1 50		
			41 00	
G. T. Railway	Freight	88		
Express Company	Charges	60		
A. McDonell	Weighing coal	4 00		
			5 48	
W. Edwards	Sundry payments		28 25	
				2,642 14
	TREASURY DEPARTMENT.			
	Departmental Salaries.			
Hon. S. C. Wood	Twelve months' salary as Treasurer			
W. R. Harris	do do Assistant Treasurer		4,000 00	
A. T. Deacon	do do Chief Clerk		2,000 00	
L. V Percival	do do Shorthand Writer & Clerk of Contingencies		1,000 00	
P. Simser	do do Clerk		1,050 00	
			600 00	
	Audit Branch.			
C. H. Sproule	Twelve months' salary as Auditor		1,600 00	
L. W. Ord	Twelve months' salary as Book-keeper		1,100 00	
A. J. Rattray	do do Clerk		800 00	
				12,150 00
	Carried forward			119,922 79

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward			119,922 79	
	TREASURY DEPARTMENT.—*Continued.*				
	DEPARTMENTAL EXPENSES.				
Wm. Warwick & Son	Binding	203 59			
C. B. Robinson	Printing	138 70			
J. Notman	Stationery	625 37			
J. Robinson & Co	Erasers	6 55			
Rowsell & Hutchison	Pens	14 40			
Winnifrith Bros	do	2 00			
H. Jacobs	do	18 00			
			1,008 61		
Rolph, Smith & Co	Cheque books, etc		222 58		
Montreal Telegraph Co	Telegrams	108 75			
Dominion Telegraph Co.	do	43 58			
H. C. Dixon	Postage stamps	731 00			
T. C. Patteson	Postage	16 39			
			899 52		
Express Company	Charges		26 08		
Sundry Newspapers	Subscriptions and advertisements		76 17		
Sundry Persons	Car tickets, etc.		22 40		
do	Cab-hire		78 63		
W. N. Douglas	Services as extra Clerk	139 99			
J. Scully	do do	60 00			
W. Westbrown	do do	16 00			
H. Macnamarra	do do	4 00			
F. H. Portas	do Messenger	250 00			
			469 99		
Might & Taylor	Directories	15 00			
Willing & Williamson	do	4 50			
			19 50		
J. E. Ellis & Co	Care of clocks	7 50			

Lugsdin & Barnett	Repairing postbag	1 50			
A. H. Paull	Refilling printograph	5 75			
			11 75		
J. C. Stuart & Co.	Books	1 00			
Maclear & Co.	do	2 00			
T. H. Smith	do	1 00			
T. L. Wilson	do	5 75			
J. B. Mackenzie	do	5 00			
J. Wilson & Son	do	5 00			
C. H. Mackintosh	do	2 00			
J. L. Lemieux	do	7 00			
Bengough Bros.	do	2 00			
J. Watson	do	20 00			
			50 75		
Wheeler & Bain	Lamps	2 50			
London & Paris House	Secretary	7 50			
C. Davis	Furni-hings	2 75			
Kenyon-Stewart Mfg Co	Stamps	21 00			
			33 75		
Hon. S. C. Wood	Travelling expenses	15 00			
C. H. Sproule	do	9 10			
L. V. Percival	To pay sundries	10 20			
			34 30		
				2,957 03	
	EAST WING, PARLIAMENT BUILDINGS.				
	Repairs, Furnishings, Fuel, Gas, Water, etc.				
Consumers' Gas Co.	Gas	167 36			
Water-Works	Water, etc.	181 33			
P. Burns	Fuel	493 77			
Sundry newspapers	Advertising fuel	8 70			
C. Burns	Ice	143 50			
T. McConnell & Co.	Wood	121 59			
G. & J. Keith	Coal	1 50			
H. B. Rathbun & Co.	Fuel	289 80			
			1,407 55		
G. & E. Evans	Tinsmithing	377 09			
William Milligan	Painting, glazing, etc.	160 20			
Ritchie & Co.	Plumbing	84 62			
Robert Jones	Bricklaying	29 35			
T. Lalor, jun.	Locksmithing	16 95			
D. Forbes	Repairing roof	40 00			
Joseph Murphy	Plastering	16 00			
			724 21		
R. Hay & Co.	Furniture	293 20			
J. Hubbard	Brushes	0 60			
E. Boeck	Duster	2 00			
	Carried forward	295 80	2,131 76	122,879 82	

CIVIL GOVERNMENT.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	295 80	2,131 76	122,879 82	
	EAST WING, PARLIAMENT BUILDINGS. *Continued.*				
	REPAIRS, FURNISHINGS, FUEL, GAS, WATER, ETC. *Continued.*				
C. T. Whatmough	Filter, dusters, etc.	36 25			
D. H. Palmer	Brooms	5 00			
Hughes Bros.	Towelling	17 45			
R. A. Wood	Brushes	3 60			
			358 10		
W. Adamson & Co.	Soap, etc.	4 85			
W. A. Bradshaw	do	16 00			
			20 85		
J. Ryan, sen	Carting ashes		14 40		
Rees' Wharf Co.	Gravel		2 00		
P. Paterson & Son	Hardware	51 02			
J. B. Smith	Lumber	14 79			
			65 81		
Hunter & Co.	Mounting maps		5 50		
J. Sinnser	Services on grounds	156 00			
P. Scully	do	176 67			
			332 67		
Mrs. B. Walker	Cleaning	7 00			
A. McDonell	Office cleaning, etc.	72 07			
J. Molloy	Clearing snow	33 30			
W. R. Dosser	Cleaning chimneys	4 40			
G. Duthie	Clearing snow	10 00			
H. Williams	Cleaning carpets	2 00			
			128 77		
A. McDonell	Services as housekeeper	600 00			
P. Chamber[illegible]	Services as fireman	400 00			
			1,000 00		
				4,059 86	
	AGRICULTURE OFFICE.				
	SALARIES.				
George W. Buckla[illegible]	Twelve months' salary as Secretary			1,000 00	

	EXPENSES.			
C. B. Robinson	Printing	31 62		
Wm. Warwick & Son	Binding	2 45		
J. Notman	Stationery	37 23		
			71 30	
H. C. Dixon	Postage stamps		70 00	
G. W. Buckland	Express charges, telegrams, &c	24 05		
do	Travelling expenses	10 00		
Hon. S. C. Wood	do	29 00		
			63 65	
Sundry newspapers	Subscription		10 64	
				214 99
	OFFICE OF INSPECTOR OF PUBLIC INSTITUTIONS.			
	SALARIES.			
J. W. Langmuir	Twelve months' salary as Inspector		3,000 00	
F. A. Carrell	do do First Clerk		1,000 00	
James McLagan	do do Second do		700 00	
H. Hayes	do do Short-hand writer and clerk		1,000 00	
R. Humphreys	Three do Messenger		62 49	
S. Cradock	Nine do do		227 50	
				5,989 99
	EXPENSES.			
W. Warwick & Son	Binding, etc.	52 80		
C. B. Robinson	Printing	112 14		
J. Notman	Stationery	291 48		
			456 42	
Dominion Telegraph Co.	Telegrams	93 77		
Montreal Telegraph Co	do	85 57		
H. C. Dixon	Postage stamps	150 00		
T. C. Patteson	Rent of P. O. Box	6 00		
E. Farrel	Postage stamps	176 00		
			511 34	
J. W. Langmuir	Travelling expenses		803 43	
G. Verral	Cab-hire	69 75		
A. J. Maddison	Express charges	2 10		
			71 85	
Might & Taylor	Directories	5 00		
J. Wilson & Son	Book	5 00		
Hunter & Co	Mounting plans	8 00		
Hart & Rawlinson	Book	0 70		
			18 70	
Sundry newspapers	Subscription and advertisements		31 50	
	Carried forward		1,893 24	134,144 66

CIVIL GOVERNMENT. *Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	.....	1,893 24	131,141 66	
	OFFICE OF INSPECTOR OF PUBLIC INSTITUTIONS. *Continued.*				
	EXPENSES.—*Continued.*				
F. A. Carrell	Sundry payments	.....	40 00		
C. F. Russell	Insurance premium	.....	75 00		
A. Langmuir	Services as extra clerk	.....	17 00		
				2,025 24	
	SECRETARY AND REGISTRAR'S DEPARTMENT.				
	DEPARTMENTAL SALARIES.				
Hon. A. S. Hardy	Twelve months' salary as Secretary and Registrar ...	3,999 98			
I. R. Eckart	Ten do Assistant Secretary	1,337 57			
G. E. Lumsden	Two do do	266 67			
R. S. Brodie	Twelve do Clerk	900 00			
J. B. McLachlan	do do do	800 00			
J. D. Wardo	do do do	750 00			
J. F. C. Ussher	do do Deputy Registrar	1,200 00			
George Hobbs	do do Clerk	800 00			
J. A. W. Innes	do do do	700 00			
A. Burtchaell	do do Messenger	400 00			
			11,151 22		
	REGISTRAR-GENERAL'S BRANCH.				
	DEPARTMENTAL SALARIES.				
H. S. Crewe	Twelve months' salary as First Clerk	1,200 00			
W. Warwick	do do Clerk	800 00			
J. M. Ridley	do do do	800 00			
J. W. Hetherington	Two do do	133 32			
F. Yeigh	Ten do do	666 68			
Frank Jones	Twelve do do	600 00			
W. H. H. Murton	Nine do do	450 00			

W. W. Jeffers	Two do do	100 00		
F. Yeigh	One do do	50 00		
			4,800 00	
	LICENSE AND ADMINISTRATION OF JUSTICE ACCOUNTS BRANCH.			
	DEPARTMENTAL SALARIES.			
Henry Totten	Twelve months' salary as First Officer	1,600 00		
J. P. Macdonnell	do do Accountant	1,200 00		
E. A. McLaurin	do do Clerk	1,000 00		
E. Jenkinson	Three do do	150 00		
C. O. Strange	Nine do do	450 00		
			4,400 00	
				20,354 22
	SECRETARY AND REGISTRAR'S OFFICES.			
	DEPARTMENTAL EXPENSES.			
H. C. Dixon	Postage	610 00		
T. C. Patteson	Rent of P. O. Box	12 00		
Montreal Telegraph Co	Telegrams	103 85		
Dominion do	do	25 01		
			750 86	
C. B. Robinson	Printing	212 14		
Wm. Warwick & Son	Binding	252 47		
			464 61	
J. Notman	Stationery	457 81		
J. C. Eckart	Binders	1 25		
Willing & Williamson	Seal and press	1 75		
Rolph, Smith & Co	do	10 00		
			470 81	
Might & Taylor	Directories	7 50		
J. C. Stuart & Co	Book	1 00		
Maclear & Co	do	2 00		
Winnifrith Bros	Register, etc	4 00		
Hart & Rawlinson	Scrap books, etc	10 15		
F. R. E. Campeau	Guide, House of Commons	3 00		
W. J. Dickson	Almanacs	0 90		
			28 55	
H. Hampton	Brushes	4 00		
J. & J. Taylor	Key	0 50		
Pim & Holt	Printograph	7 00		
A. H. Paull	Refilling printograph	2 25		
C. S. Kenyon	Die	5 00		
			18 75	
	Carried forward		1,733 58	156,524 12

CIVIL GOVERNMENT.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		1,733 58	156,524 12	
	SECRETARY AND REGISTRAR'S OFFICES.—*Continued.*				
	DEPARTMENTAL EXPENSES.—*Continued.*				
G. Verral	Cab-hire	57 95			
J. Moran	do	1 00			
Express Co	Charges	0 50			
			59 45		
J. E. Ellis & Co	Care of clocks		7 00		
J. Scully	Services as extra clerk	60 00			
D. H. Doust	Engrossing patents, etc	13 25			
F. J. Manley	Fees *Re* Gilchrist examination	10 00			
A. Baker	do do	10 00			
			93 25		
Sundry Newspapers	Subscriptions and advertising		221 75		
J. B. McLachlan	Sundry payments		3 80		
				2,118 83	
	REGISTRAR GENERAL'S BRANCH.				
	DEPARTMENTAL EXPENSES.				
C. B. Robinson	Printing	867 58			
Wm. Warwick & Son	do	908 01			
J. Notman	Stationery	217 68			
			1,993 27		
Montreal Telegraph Co	Telegrams	4 64			
Dominion do	do	0 49			
			5 13		
H. C. Dixon	Postage stamps		305 00		
Rolph, Smith & Co	Steel die	7 00			
Winnifrith Bros	Pens	1 00			
			8 00		
Might & Taylor	Directories		5 00		
B. Jackson	Brushes		4 50		
D. Patterson	Services as Registrar, unorganized townships	35 20			

T. Collins	do do	8 90			
			44 10		
L. Mercer	Services as extra Clerk	2 00			
G. G. Laird	do do	50 00			
J. B. McDonald	do do	184 00			
			236 00		
H. S. Crewe	Travelling expenses		278 15		
Sundry Newspapers	Subscription and advertising		65 64		
G. Verral	Cab-hire	1 75			
W. Bacon	Express charges	4 00			
			5 75		
				2,950 54	
	LICENSE AND ADMINISTRATION OF JUSTICE ACCOUNTS BRANCH.				
	DEPARTMENTAL EXPENSES.				
Wm. Warwick & Son	Binding	6 50			
C. B. Robinson	Printing	47 67			
J. Notman	Stationery	118 18			
			172 35		
Might & Taylor	Directory	2 50			
W. J. Dickson	Almanacs	0 60			
Hart & Rawlinson	Letter book, etc	9 85			
			12 95		
Winnifrith Bros	Pens	1 00			
S. W. Johnston	Refilling lithogram	7 40			
			8 40		
Montreal Telegraph Co	Telegrams	4 12			
Dominion do	do	5 70			
			9 82		
H. C. Dixon	Postage Stamps		250 25		
Express Company	Charges	1 45			
R. Bond	Cab-hire	3 00			
G. Verral	do	16 75			
			21 20		
Sundry persons	Ink, postage, etc	1 49			
Sundry Newspapers	Subscription	4 00			
			5 49		
H. Totten	Travelling expenses	2 20			
H. C. Clarke	Trunk for papers	1 75			
T. Lalor, Jr	Repairing press	1 50			
			5 45		
				485 91	
	IMMIGRATION OFFICE.				
	SALARIES.				
David Spence	Twelve months' salary as Secretary			1,200 00	
	Carried forward			163,279 40	

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward			163,279 40	
	IMMIGRATION OFFICE.—*Continued.*				
	EXPENSES.				
C. B. Robinson	Printing	81 25			
W. Warwick & Son	Binding	31 58			
J. Notman	Stationery	99 57			
			212 40		
G. & E. Evans	Tinsmithing		8 51		
Pim & Holt	Printograph	5 00			
Dominion Tel. Co	Telegrams	8 82			
			13 82		
H. C. Dixon	Postage stamps	55 00			
E. Jenkinson	do	25 00			
			80 00		
Sundry newspapers	Subscription	14 30			
Might & Taylor	Directory	2 50			
			16 80		
G. Verral	Cab-hire		9 90		
D. Spence	Sundries, postage, etc.		36 57		
				378 00	
	MISCELLANEOUS.				
	OFFICIAL GAZETTE.				
C. B. Robinson	Printing	2,233 27			
Wm. Warwick & Son	Binding	361 95			
Barber Brns.	Paper	743 60			
			3,338 82		
	QUEEN'S PRINTER'S OFFICE.				
John Notman	Twelve months' salary as Queen's Printer	1,200 00			
W. P. Gundy	do do Clerk	500 00			
J. Notman	Stationery	78 15			
H. C. Dixon	Postage stamps	40 00			
W. Butler	Boxes for distributing stationery	36 00			
			1,854 15		

	INSPECTOR OF REGISTRY OFFICES.				
Hon. S. Smith	Twelve months' salary as Inspector		1,500 00		
	INSPECTOR OF DIVISION COURTS.				
Joseph Dickie	Twelve months' salary as Inspector	1,400 00			
do	Travelling expenses, advertising, stationery, and postage	400 00			
J. Notman	Stationery	49 61			
C. B. Robinson	Printing	27 64			
William Warwick	Ruling	9 26			
W. J. Dick	Services as Clerk	134 00			
			2,020 51		
	INSPECTOR OF INSURANCE COMPANIES.				
	SALARIES.				
W. T. O'Reilly	Twelve months' salary as Inspector	2,000 00			
C. B. Perry	do do Clerk	600 00			
	EXPENSES.				
C. B. Robinson	Printing	73 28			
W. Warwick & Son	Binding	70 33			
J. Notman	Stationery	141 30			
Montreal Tel. Co.	Telegrams	1 51			
H. C. Dixon	Postage	30 00			
R. Hay & Co.	Furniture	64 00			
Wheeler & Bain	Stove, Furnishings, etc.	21 85			
L. E. Battegay	Clock	3 25			
G. Harcourt	Bag	3 00			
Kenyon-Stewart Co.	Stamps	8 00			
W. T. O'Reilly	Travelling expenses	380 00			
do	Sundry payments	8 75			
W. Hurst	Express	0 75			
Sundry newspapers	Subscriptions	12 75			
M. Smith	Office cleaning	10 00			
		3,428 77			
	Less amount received on account of assessments	2,991 98			
			436 79		
	GENERAL CLERK OF WORKS AND REPAIRS FOR PUBLIC INSTITUTIONS.				
F. P. O'Callaghan	Nine months' salary as General Clerk of Works		900 00		
	INSPECTION OF COUNTY OFFICES.				
Yokome & Hanu	Printing Report of County Clerks' Association		25 00		
				10,075 27	
	Total Civil Government				173,732 67
	Carried forward				173,732 67

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward				173,732 67
	LEGISLATION.				
	OFFICIAL SALARIES.				
Hon. C. Clarke	Services as Speaker		1,250 00		
C. T. Gillmor	Twelve months' salary as Clerk of the House		1,800 00		
A. H. Sydere	do do Assistant do		1,000 00		
J. R. Cartwright	do do Law Clerk		1,000 00		
J. M. Delamere	do do Clerk		900 00		
S. J. Watson	do do Librarian		1,400 00		
J. Notman	do do Accountant		400 00		
F. J. Glackmeyer	do do Sergeant-at-Arms		600 00		
T. Phillips	do do Housekeeper and Chief Messenger		600 00		
J. Bowman	do do Messenger		450 00		
W. Kennedy	do do do		450 00		
J. Wells	do do Night Watchman		450 00		
J. Foley	do do Fireman		400 00		
				10,700 00	
	POSTAGES AND COST OF HOUSE POST OFFICE.				
T. C. Patteson	Postage		501 39		
H. C. Dixon	Postage stamps		1,110 00		
Express Co.	Charges		239 80		
Lugsdin & Barnett	Postbag		10 50		
J. Buckley	Carriage of Mail		50 00		
Joseph Power	do		320 00		
Rice Lewis & Son	Letter scales, etc		27 00		
Kenyon-Stewart Manuf'g Co.	Stamp		8 00		
				2,266 69	
	STATIONERY, PRINTING AND BINDING.				
Hunter, Rose & Co.	Printing and binding		407 13		
C. B. Robinson	Printing		3,589 01		

Wm. Warwick & Son	Binding		5,757 38		
Wm. Barber & Bros	Paper		5,881 90		
John Notman	Stationery		2,064 70		
Hunter & Co.	Photographs of public institutions for report		20 50		
Willing & Williamson	Stationery		77 75		
				17,798 37	
	PRINTING BILLS AND DISTRIBUTING STATUTES.				
C. B. Robinson	Printing		2,700 00		
H. C. Dixon	Postage stamps		104 00		
American Express Co	Charges		113 70		
J. Notman	Freight charges		15 35		
				2,933 05	
	INDEMNITY TO MEMBERS.				
J. Notman	To pay members of Parliament			54,699 80	
	SESSIONAL WRITERS, MESSENGERS, PAGES, &c.				
A. B. Ord	Services as Sessional Writer		212 00		
J. Mann	do do		170 00		
R. A. Kent	do do		410 00		
S. T. Bastedo	do do		150 00		
F. C. Capreol	do do		150 00		
H. Clark	do do		290 00		
M. C. Fraser	do do		125 00		
F. Holmes	do do		150 00		
F. T. Joseph	do do		424 00		
T. P. M. Morgan	do do		150 00		
T. J. O'Leary	do do		150 00		
J. G. Rosseau	do do		150 00		
C. H. Thompson	do do		150 00		
J. M. Watson	do do		150 00		
T. Marshall	do do		120 00		
H. Tatham	do do		120 00		
J. J. Burns	do do		120 00		
J. Rollo	do do		120 00		
M. J. Granger	do do		120 00		
M. J. Stenson	do do		158 00		
J. Scully	do do		120 00		
R. B. Scott	do do		120 00		
T. J. Muir	do do		162 00		
J. George	do do		120 00		
W. A. Hope	do do		260 00		
A. W. Ross	do do		120 00		
C. B. Midford	do do		35 00		
	Carried forward		4,526 00	88,397 91	173,732 67

LEGISLATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		4,526 00	88,397 91	173,732 67
	SESSIONAL WRITERS, MESSENGERS, PAGES, ETC.—*Con.*				
G. E. Thomas	Services as Sessional Writer		92 00		
L. V. Percival	Services reporting		40 00		
A. C. Campbell	do		94 40		
G. Eyvel	do		61 18		
A. Horton	do		43 70		
H. M. Matthewson	do		21 00		
P. Aylward	Services as Messenger		90 00		
M. Bailey	do		138 00		
M. Carrol	do		90 00		
F. Clarke	do		90 00		
T. Derrick	do		90 00		
D. Ferguson	do		90 00		
T. Fitch	do		90 00		
M. Haley	do		93 00		
P. Kanan	do		90 00		
J. Kennedy	do		118 00		
W. Lamb	do		518 32		
T. Lynch	do		85 50		
J. J. Muldoon	do		90 00		
M. McArthy	do		90 00		
R. McBride	do		90 06		
T. Newton	do		90 00		
M. Power	do		90 00		
F. Rogers	do		90 00		
W. Wells	do		150 00		
W. Chambers	Services as Page		45 00		
W. Kennedy	do		45 00		
C. R. Notman	do		45 00		
R. O'Farrell	do		45 00		
J. Smith	do		45 00		
D. Crowe	Services as Fireman		90 00		
J. Emonds	do		93 00		
J. Murphy	do		277 00		
Mrs. Kanean	Services as Duster		32 50		

Mrs. Lamont	do		32 50		
Mrs. McGraft	do		32 50		
				7,933 60	
	LIBRARY.				
W. Warwick & Son	Binding	206 47			
Rowsell & Hutchinson	Binding, etc.	55 72			
			262 19		
Willing & Williamson	Books	866 00			
E. G. Allen	do	693 60			
Carswell & Co	do	211 75			
J. M. Duff	do	7 00			
J. Wiley & Sons	do	152 27			
R. M. Bucke, M.D.	do	10 00			
John Lovell	do	5 50			
G. A. Desjardines	do	3 10			
M. Mathieu	do	10 00			
F. H. Smith	do	1 00			
G. Virtue	do	27 60			
— Lancefield	do	5 00			
Dawson Bros.	do	31 16			
Hart & Rawlinson	do	142 56			
W. Warwick & Son	do	14 40			
Maclear & Co.	do	2 00			
Bengough Bros.	do	1 30			
J. McCormack	do	1 00			
Belford & Co.	do	5 00			
J. Watson	do	10 00			
W. R. Haight	do	29 93			
J. J. Allworth	do	25 00			
R. Hubertus	do	7 00			
W. R. Scott	do	5 00			
J. H. Alexander	do	50 00			
Rev. C. P. Mulvaney	do	1 00			
Hunter, Rose & Co.	do	4 75			
J. B. Magurn	do	8 00			
W. Gould	do	0 75			
A. B. Yohn	do	7 00			
J. Notman	do	1 80			
Richardson & Co	do	5 00			
W. H. Irwin	do	3 50			
G. M. Adam	do	10 00			
H. Kemp	do	1 00			
E. L. Dayton	do	6 00			
C. B. Robinson	do	125 00			
A. Piddington	do	4 00			
T. W. H. Leavitt	do	4 50			
			2,499 47		
	Carried forward		2,761 66	96,331 51	173,732 67

LEGISLATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		2,761 66	96,331 51	173,732 67
	LIBRARY.—*Continued.*				
Might & Taylor	Directories	7 50			
W. H. Irwin	Directory	4 25			
			11 75		
Sundry newspapers	Subscriptions	64 68			
W. Herron	Framing pictures	30 00			
Hart & Rawlinson	Division Court Acts	2 50			
T. J. Richardson	Hansard	7 00			
			104 18		
Express Company	Charges		156 65		
J. M. Watson	Services *re* Catalogue		376 00		
C. H. Irwin	Custom duties	7 50			
Robinson & Heath	do	33 60			
G. T. Railway	Freight	11 08			
			52 18		
				3,462 42	
	CONTINGENCIES.				
Montreal Telegraph Co.	Telegrams	17 98			
Dominion do	do	6 19			
			24 17		
Rolph, Smith & Co	Engraving	7 00			
H. Anderson	do	25 00			
R. McWilliams	do	31 00			
			63 00		
S. J. Watson	Books	100 00			
A. Todd	do	500 00			
McLean, Rogers & Co.	Debates House of Commons	29 00			
Willing & Williamson	Periodicals	86 60			
Queen's Printer, Ottawa	Statutes of Canada	29 85			
Brown Bros.	Scrap books	4 20			
J. Notman	Stationery	784 67			
			1,531 32		
Express Company	Charges	165 15			
J. Verral	Cab-hire	84 00			
J. Buckley	do	27 50			
Sundry persons	do	12 50			
			289 15		

C. Thomson	Brooms, etc.	72 55			
B. H. Palmer	Brushes	5 00			
W. Brydon	Brushes, etc.	23 30			
			100 85		
K. Phillips	Office cleaning and washing	183 00			
E. Kannan	do	45 50			
M. Smith	do	16 00			
M. Phillips	do	117 40			
K. McKenna	do	137 50			
D. Kannan	Cleaning ash pit	26 00			
W. Dossor	Cleaning chimneys	7 20			
			532 60		
J. H. Samo	Furnishings	6 40			
H. Jacobs	do	7 00			
G. Harrison	do	1 05			
G. & J. Murray	do	1 75			
Stovel & Armstrong	do	242 55			
			258 75		
T. Phillips	Meals to Telegraph Operators, as per arrangement with Companies	.....	104 45		
Sundry newspapers	Subscriptions and advertising	.....	1,139 69		
Collector of Customs	Duty	.....	109 65		
T. M. Simons	Services in Queen's Printer's Office	606 00			
G. Burden	do do	480 00			
D. J. O'Donoghue	do do	99 00			
			1,185 00		
	REPAIRS, ETC.			5,341 63	
Wm. Milligan	Painting, glazing, &c	120 76			
Ritchie & Co.	Plumbing	398 77			
J. B. Smith	Lumber	115 81			
Charles Potter	Repairing battery	4 50			
P. Paterson & Son	Hardware	106 57			
R. Jones	Bricklaying	68 04			
J. E. Ellis & Co	Clocks	45 00			
R. Hay & Co	Furniture, etc	696 20			
T. Lalor, jun	Bellhanging, locksmithing, etc.	239 70			
G. & E. Evans	Tinsmithing, etc.	325 05			
D. Forbes	Roofing	258 00			
Joseph Murphy	Plastering	15 50			
E. & C. Gurney	Furnace, etc	15 80			
			2,409 70		
Consumers' Gas Co	Gas	906 25			
Water-Works	Water	566 31			
P. Burns	Fuel	194 98			
C. Burns	Ice	144 00			
T. McConnell & Co	Wood	135 33			
H. B. Rathbun & Son	Fuel	855 07			
			2,801 97		
J. Malloy	Clearing snow	33 40			
P. Scully	Work on grounds	176 66			
	Carried forward	210 06	5,211 67	105,135 56	173,732 67

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	210 06	5,211 67	105,135 56	173,732 67
	REPAIRS, ETC. *Continued.*				
J. Simser	Services, grounds	156 00			
A. McDonald	Services weighing coal	4 00			
G. Duthie	Clearing snow	20 00			
J. Ryan	Rolling sod	2 50			
Rees' Wharf Co.	Gravel	2 00	392 56		
G. Leslie & Son	Trees and shrubs	65 40			
J. Fleming	Plants	10 20			
G. Michael	Furnishings	2 00	77 60		
W. Arthurs & Co.	do	60 65			
G. Harrison	do	184 49			
E. Hooper & Co.	do	10 00			
R. Wilkes	do	20 16			
C. Thomson	do	36 40			
W. Wharin	do	83 50			
Petley & Co.	do	300 62			
W. H. Sparrow	do	14 90			
J. Kay	do	26 63			
Electric Hardware Co.	do	16 50			
			755 85		
Sundry newspapers	Advertising fuel		12 20		
				6,449 88	
	Total Legislation				111,585 44
	ADMINISTRATION OF JUSTICE.				
	SUPERIOR JUDGES AND COURT OF APPEAL.				
Hon. Thos. Moss	Chief Justice, Court of Appeal, allowance granted 3 Vic., cap. 5	1,000 00			
Hon. J. Hagarty	do do Queen's Bench	1,000 00			

Hon. A. Wilson	do do Common Pleas	1,000 00		
Hon. J. C. Morrison	Judge, Court of Appeal	1,000 00		
Hon. C. S. Patterson	do do Appeal	1,000 00		
Hon. M. C. Cameron	do do Queen's Bench	1,000 00		
Hon. J. D. Armour	do do do	1,000 00		
Hon. G. W. Burton	do do do	1,000 00		
Hon. E. Osler	do do Common Pleas	1,000 00		
Hon. T. Galt	do do do	1,000 00		
Hon. J. G. Spragge	Chancellor	1,000 00		
Hon. S. H. Blake	Vice-Chancellor	1,000 00		
Hon. Wm. Proudfoot	do	1,000 00		
Jas. Alexander	Twelve months' salary as Usher and Crier	75 00		
			13,075 00	
Alex. Grant	do do Registrar	2,000 00		
Eli Oliver	do do Messenger	450 00		
			2,450 00	
	EXPENSES.			
William Warwick & Son	Printing	30 95		
C. B. Robinson	do	19 46		
J. Notman	Stationery	49 78		
Rolph, Smith & Co	Stereotyping, etc	12 20		
Geo. Rigg	Repairing furniture	4 25		
Alex. Grant	To pay postage express, etc,	64 50		
W. J. Whitten & Co	Tin case	16 00		
W. Hewitt & Co	Lock	1 00		
H. Graham & Co	Rug	25 00		
E. Hodgkinson	Furniture	10 00		
E. Merritt	Papering, etc	23 00		
Jno. Hurst	Plumbing	4 00		
C. S. Grant	Engrossing and entering orders	360 00		
Hon. C. S. Patterson	Grant for Library	100 00		
S. Field	Scrubbing	2 00		
			722 14	
				16,247 14
	COURT OF CHANCERY.			
	SALARIES.			
T. W. Taylor	Twelve months' salary as Master		3,000 00	
J. H. Thom	do do Taxing officer		1,600 00	
N. McLean	do do Clerk		1,000 00	
R. M. Ross	do do Junior Clerk		600 00	
B. W. Murray	do do Accountant		1,400 00	
A. D. Stewart	Nine do Assistant do		375 00	
G. B. Behan	Three do do		135 96	
R. P. Stephens	Twelve do Referee in Chambers		2,000 00	
F. Arnoldi	do do Clerk		900 00	
	Carried forward		1,010 96	16,247 14 285,318 11

ADMINISTRATION OF JUSTICE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		11,010 96	16,247 14	285,318 11
	COURT OF CHANCERY.—*Continued.*				
	SALARIES.—*Continued.*				
G. S. Holmsted	Twelve months' salary as Registrar		2,100 00		
A. F. McLean	do do First Assistant Registrar		1,200 00		
G. M. Lee	do do Second do		1,000 00		
A. Holmsted	do do Clerk of Records and Writs		1,200 00		
W. D. Crofton	do do Clerk		650 00		
H. A. Semple	do do do		600 00		
R. Parkes	do do Usher of Court		600 00		
D. W. Sutherland	do do Messenger and Housekeeper		400 00		
				18,760 96	
	EXPENSES.				
C. B. Robinson	Printing	151 81			
W. Warwick & Son	Binding	313 89			
			465 70		
J. Notman	Stationery	372 21			
Brown Bros	Stationery	8 45			
Rowsell & Hutchinson	Books	26 50			
			407 16		
D. W. Sutherland	Office cleaning, etc.	17 23			
M. O'Connor	Cleaning windows	15 75			
			32 98		
Rolph, Smith & Co	Stamps, etc.	9 55			
Kenyon-Stewart Mfg. Coy	Stamps, etc.	8 00			
			17 55		
W. Burns & Co	Ice		14 00		
G. S. Holmsted	To pay postage, telegrams, etc.	45 80			
T. W. Taylor	do	5 00			
			50 80		
Hon. W. Proudfoot	Grant to Library		200 00		
J. E. Ellis & Co	Care of clocks		15 00		
W. O'Neil	Copying	60 00			

E. J. Harding	Services as extra clerk	64 00			
L. B. Young	do	325 00			
			449 00		
Globe Printing Co	Printing		5 00		
				1,657 19	
	COURT OF QUEEN'S BENCH.				
	Salaries.				
R. G. Dalton	Twelve months' salary as Clerk of Crown & Pleas		3,000 00		
John Small	do do Senior clerk		1,400 00		
A. Macdonell	do do Clerk		1,300 00		
M. C. Jarvis	do do Junior clerk		600 00		
W. M. Ross	do do Clerk of Process		1,260 00		
C. A. Steward	do do Assistant to do		700 00		
James Alexander	do do Housekeeper and Messenger		500 00		
A. Fleming	do do Usher and Crier		160 00		
F. Creys	Five do do Assistant Messenger		66 65		
A. R. Sowdon	Seven do do do		93 35		
				9,020 00	
	Expenses.				
H. C. Dixon	Postage Stamps	10 00			
R. G. Dalton	To pay postage	3 00			
W. M. Ross	do	18 00			
			31 00		
C. B. Robinson	Printing	39 17			
William Warwick & Son	do	54 40			
J. Notman	Stationery	65 98			
			159 55		
Hon. G. W. Burton	Grant for Library		100 00		
				290 55	
	COURT OF COMMON PLEAS.				
	Salaries.				
M. B. Jackson	Twelve months' salary as Clerk of Common Pleas		2,500 00		
S. B. Clark	do do Senior Clerk		1,400 00		
B. T. Jackson	do do Junior do		1,000 00		
P. O'Connell	do do Usher and Crier		160 00		
				5,060 00	
	Expenses.				
M. B. Jackson	To pay postage, etc	20 00			
C. B. Robinson	Printing	19 38			
William Warwick & Son	Binding	6 94			
	Carried forward	46 32		51,035 84	285,318 11

ADMINISTRATION OF JUSTICE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	46 32		51,035 44	285,318 11
	COURT OF COMMON PLEAS.—*Continued.*				
	EXPENSES. *Continued.*				
J. Notman	Stationery	34 33			
			80 65		
Hon. Thomas Galt	Grant to Judge's Library		100 00		
				180 65	
	PRACTICE COURT.				
W. B. Heward	Twelve months' salary as Clerk		1,800 00		
J. Notman	Stationery		31 88		
W. B. Heward	To pay postages		5 00		
				1,836 88	
	SURROGATE COURT.				
Sir J. L. Robinson	Twelve months' salary as Clerk		2,000 00		
C. B. Robinson	Printing	23 71			
W. Warwick & Son	Binding	33 44			
J. Notman	Stationery	3 25			
			60 40		
				2,060 40	
	ASSIZE CLERK.				
G. B. Nicol	Twelve months' salary as Clerk		1,000 00		
do	Postage	8 00			
C. B. Robinson	Printing	0 92			
do	"Ontario Gazette"	0 50			
J. Notman	Stationery	10 18			
J. B. Ryan	Erasers	1 60			

B. & M. Saunders	Bag	4 60			
Petley & Co	Carpeting	3 52			
			28 72		
				1,028 72	
	CROWN COUNSEL PROSECUTIONS.				
J. K. Kerr	Services, Winter Assizes, 1879, Wentworth		58 00		
Æ. Irving	do do York		558 00		
John Crerar	do Spring Assizes, 1880, Brant		120 00		
Colin McDougall	do do Bruce		188 00		
Hon. R. W. Scott	do do Carleton		204 00		
Hugh McMahon	do do Elgin		146 00		
Colin McDougall	do do Essex		66 00		
D. B. Maclennan	do do Frontenac		142 00		
Alfred Frost	do do Grey		210 00		
J. K. Kerr	do do Haldimand		20 00		
John Dewar	do do Halton		10 00		
B. M. Britton	do do Hastings		118 45		
Colin McDougall	do do Huron		34 00		
James F. Lister	do do Kent		78 00		
Hugh McMahon	do do Lambton		86 00		
Hon. R. W. Scott	do do Lanark		60 00		
B. M. Britton	do do Leeds and Grenville		102 00		
J. E. McDougall	do do do		40 00		
Thomas Holden	do do Lennox and Addington		46 00		
J. K. Kerr	do do Lincoln		158 00		
Æ. Irving	do do Middlesex		456 00		
Thomas Hodgins	do do Northumberland and Durham		324 00		
John Crerar	do do Norfolk		205 00		
Thomas Hodgins	do do Ontario		165 75		
F. R. Ball	do do Oxford		260 00		
Thomas Hodgins	do do Peel		40 00		
Warren Rock	do do Perth		20 00		
Thomas Hodgins	do do Peterborough		20 00		
Alexander Gibb	do do Prescott and Russell		26 00		
Thomas Holden	do do Prince Edward		20 00		
Hon. R. W. Scott	do do Renfrew		48 00		
J. W. Kerr	do do Stormont, Dundas and Glengarry		74 00		
John Crerar	do do Simcoe		82 00		
Thomas Hodgins	do do Victoria		84 24		
John Crerar	do do Waterloo		20 00		
J. K. Kerr	do do Welland		98 00		
J. W. Bowlby	do do Wellington		242 00		
John Dewar	do do Wentworth		191 50		
Æ. Irving	do do York		275 00		
do	do Summer Assizes, do		473 00		
J. M. Hamilton	do Fall Assizes, Algoma		39 00		
John Crerar	do do 1880, Brant		128 00		
Colin McDougall	do do Bruce		52 00		
	Carried forward		6,384 94	56,142 49	285,318 11

ADMINISTRATION OF JUSTICE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		6,384 94	56,142 49	285 318 11
	CROWN COUNSEL PROSECUTIONS.—*Continued.*				
Hon. R. W. Scott	Services Fall Assizes, 1880, Carleton		116 00		
Hugh McMahon	do do Elgin		278 00		
James F. Lister	do do Essex		84 00		
G. E. Henderson	do do Frontenac		119 00		
John Crerar	do do Grey		171 00		
J. K. Kerr	do do Haldimand		32 00		
J. W. Bowlby	do do Halton		30 00		
B. M. Britton	do do Hastings		106 00		
Colin McDougall	do do Huron		46 00		
J. F. Lister	do do Kent		64 00		
Warren Rock	do do Lambton		150 00		
Hon. R. W. Scott	do do Lanark		55 00		
B. M. Britton	do do Leeds and Grenville		81 00		
do	do do Lennox and Addington		20 00		
J. K. Kerr	do do Lincoln		36 00		
Æ. Irving	do do Middlesex		522 00		
Thomas Hodgins	do do Northumberland and Durham		137 00		
do	do do Ontario		192 25		
F. R. Ball	do do Oxford		192 00		
C. McFayden	do do Peel		20 00		
Thomas Hodgins	do do Perth		150 00		
Hon. R. W. Scott	do do Prescott and Russell		64 00		
G. E. Henderson	do do Prince Edward		168 00		
Hon. R. W. Scott	do do Renfrew		105 00		
Thomas Hodgins	do do Simcoe		186 55		
J. W. Bowlby	do do do		72 00		
Hon. R. W. Scott	do do Stormont, Dundas, and Glengarry		70 00		
Thomas Hodgins	do do Victoria		52 00		
John Crerar	do do Waterloo		20 00		
J. K. Kerr	do do Welland		108 00		
Thomas Hodgins	do do Wellington		147 00		
Hugh McMahon	do do Wentworth		104 00		
Æ. Irving	do do York		189 00		
				9,674 74	

	GENERAL ADMINISTRATION OF JUSTICE IN COUNTIES.				
W. S. Campbell	On account of Expenditure as Treasurer, County of Brant,				
	December Quarter, 1879	3,667 95			
	March Quarter, 1880	531 66			
	June Quarter, 1880	927 12			
	September Quarter, 1880	871 67			
			5,998 40		
J. G. Cooper	On account of Expenditure as Treasurer, County of Bruce,				
	December Quarter, 1879	1,272 97			
	March Quarter, 1880	517 93			
	June Quarter, 1880	821 66			
	September Quarter, 1880	552 99			
			3,165 55		
William Cowan	On account of Expenditure as Treasurer, County of Carleton,				
	September Quarter, 1879	1,120 73			
	December Quarter, 1879	859 93			
	March Quarter, 1880	631 36			
	June Quarter, 1880	1,050 44			
			3,662 46		
J. A. Kains	On account of Expenditure as Treasurer, County of Elgin,				
	December Quarter, 1879	1,699 57			
	March Quarter, 1880	969 36			
	June Quarter, 1880	1,237 13			
	September Quarter, 1880	591 34			
			4,497 40		
Thomas H. Wright	On account of Expenditure as Treasurer, County of Essex,				
	September Quarter, 1879	450 42			
	December Quarter, 1879	1,201 68			
	March Quarter, 1880	916 81			
	June Quarter, 1880	878 84			
			3,447 75		
J. Irvine	On account of Expenditure as Treasurer, County of Frontenac,				
	December Quarter, 1879	728 50			
	March Quarter, 1880	435 35			
	June Quarter, 1880	1,092 31			
			2,256 16		
S. J. Parker	On account of Expenditure as Treasurer, County of Grey,				
	December Quarter, 1879	1,343 90			
	March Quarter, 1880	531 47			
	June Quarter, 1880	1,743 70			
	September Quarter, 1880	971 69			
			4,590 76		
A. P. Farrell	On account of Expenditure as Treasurer, County of Haldimand,				
	June Quarter, 1879	830 61			
	September Quarter, 1879	434 83			
	December Quarter, 1879	692 83			
	Carried forward	1,958 27	27,618 48	65,817 23	285,318 11

ADMINISTRATION OF JUSTICE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	1,958 27	27,618 48	65,817 23	285,318 11
	GENERAL ADMINISTRATION OF JUSTICE IN COUNTIES.—*Continued.*				
A. P. Farrell	On account of Expenditure as Treasurer, County of Haldimand, March Quarter, 1880	563 27			
	June Quarter, 1880	300 56	2,822 10		
F. McCallum	On Account of Expenditure as Treasurer, County of Halton, September Quarter, 1879	481 43			
	December Quarter, 1879	268 22			
	March Quarter, 1880	374 67			
	June Quarter, 1880	196 49	1,320 81		
Thomas Wills	On Account of Expenditure as Treasurer, County of Hastings, September Quarter, 1879	147 93			
	December Quarter, 1879	1,292 73			
	March Quarter, 1880	506 82			
	June Quarter, 1880	418 03			
	September Quarter, 1880	623 87	2,989 38		
A. M. Ross	On Account of Expenditure as Treasurer, County of Huron, December Quarter, 1879	942 98			
	March Quarter, 1880	635 88			
	June Quarter, 1880	627 78			
	September Quarter, 1880	481 02	2,687 66		
C. G. Charteris	On Account of Expenditure as Treasurer, County of Kent, December Quarter, 1879	856 96			
	March Quarter, 1880	932 67			
	June Quarter, 1880	672 77			
	September Quarter, 1880	264 52	2,726 92		
Hon. A. Vidal	On Account of Expenditure as Treasurer, County of Lambton, September Quarter, 1879	477 07			
	December Quarter, 1879	1,062 94			
	March Quarter, 1880	1,048 99			
	June Quarter, 1880	878 29	3,467 29		

W. W. Berford	On Account of Expenditure as Treasurer, County of Lanark, December Quarter, 1879	597 84			
	March Quarter, 1880	530 71			
	September Quarter, 1880	428 10			
	June Quarter, 1880	391 27			
			1,947 92		
F. Schofield	On Account of Expenditure as Treasurer, Counties of Leeds and Grenville, December Quarter, 1879	660 03			
	March Quarter, 1880	291 66			
	June Quarter, 1880	593 93			
	September Quarter, 1880	312 41			
			1,858 03		
E. Hooper	On Account of Expenditure as Treasurer, Counties of Lennox and Addington, December Quarter, 1879	334 97			
	March Quarter, 1880	79 70			
J. M. Parrott	June Quarter, 1880	468 67			
			883 34		
G. P. M. Ball	On Account of Expenditure as Treasurer, County of Lincoln, December Quarter, 1879	919 61			
	March Quarter, 1880	519 42			
	June Quarter, 1880	839 13			
	September Quarter, 1880	364 97			
			2,643 13		
A. Murray	On Account of Expenditure as Treasurer, County of Middlesex, September Quarter, 1879	1,047 13			
	December Quarter, 1879	2,836 74			
	March Quarter, 1880	1,398 35			
	June Quarter, 1880	2,137 92			
			7,420 14		
H. Groff	On Account of Expenditure as Treasurer, County of Norfolk, September Quarter, 1879	514 74			
	December Quarter, 1879	1,273 80			
	March Quarter, 1880	432 31			
	June Quarter, 1880	1,282 33			
	September Quarter, 1880	486 71			
			3,989 89		
E. A. Macnachtan	On Account of Expenditure as Treasurer, Counties of Northumberland and Durham, December Quarter, 1879	1,531 67			
	March Quarter, 1880	518 40			
	June Quarter, 1880	1,620 09			
	September Quarter, 1880	797 50			
			4,467 66		
W. Laing	On Account of Expenditure as Treasurer, County of Ontario, September Quarter, 1879	824 21			
	December Quarter, 1879	1,115 99			
	March Quarter, 1880	625 27			
	June Quarter, 1880	1,308 11			
	September Quarter, 1880	407 84			
			4,281 42		
	Carried forward		71,124 17	65,817 23	285,318 11

ADMINISTRATION OF JUSTICE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Carried forward	.....	71,124 17	65,817 23	285,318 11
	GENERAL ADMINISTRATION OF JUSTICE IN COUNTIES.—*Continued.*				
H. P. Brown	On Account of Expenditure as Treasurer, County of Oxford, December Quarter, 1879.....	993 66			
	March Quarter, 1880.....	778 45			
	June Quarter, 1880.....	512 54			
	September Quarter, 1880.....	325 93	2,610 58		
G. Graham.....	On Account of Expenditure as Treasurer, County of Peel, September Quarter, 1879	90 47			
	December Quarter, 1879.....	354 32			
	March Quarter, 1880.....	314 14			
	June Quarter, 1880.....	201 98	960 91		
A. Monteith.....	On Account of Expenditure as Treasurer, County of Perth, September Quarter, 1879.	292 22			
	December Quarter, 1879.....	799 10			
	March Quarter, 1880.....	590 31	1,681 63		
E. Pearse	On Account of Expenditure as Treasurer, County of Peterborough, December Quarter, 1879.....	374 06			
	March Quarter, 1880.....	113 08			
	June Quarter, 1880	314 48	877 48		
J. W. Marston	On Account of Expenditure as Treasurer, Counties of Prescott and Russell, September Quarter, 1879.....	398 78			
	December Quarter, 1879..	360 46			
	June Quarter, 1880.....	417 03			
	September Quarter, 1880.....	180 12	1,356 39		
R. J. Chapman.	On Account of Expenditure as Treasurer, County of Prince Edward December Quarter, 1879.....	406 81			
	March Quarter, 1880.....	130 00			
	June Quarter, 1880.....	489 28			
	September Quarter, 1880.....	388 85	1,414 97		

E. Bourke	On Account of Expenditure as Treasurer, County of Renfrew				
	December Quarter, 1879	845 20			
	March Quarter, 1880	546 36			
	June Quarter, 1880	720 65			
	September Quarter, 1880	645 43			
			2,757 64		
H. R. A. Boys	On Account of Expenditure as Treasurer, County of Simcoe,				
	September Quarter, 1879	1,176 08			
	December Quarter, 1879	1,065 55			
	March Quarter, 1880	1,488 21			
	June Quarter, 1880	865 54			
			4,595 38		
R. McDonald	On Account of Expenditure as Treasurer, Counties of Stormont, Dundas and Glengarry,				
	December Quarter, 1879	525 98			
	March Quarter, 1880	361 03			
	June Quarter, 1880	732 58			
	September Quarter, 1880	700 66			
			2 320 25		
T. Matchett	On Account of Expenditure as Treasurer, County of Victoria,				
	December Quarter, 1879	534 29			
	March Quarter, 1880	651 50			
	June Quarter, 1880	702 63			
	September Quarter, 1880	254 48			
			2,142 90		
J. McGlashan	On Account of Expenditure as Treasurer, County of Welland,				
	September Quarter, 1879	693 70			
	December Quarter, 1879	1,548 15			
	March Quarter, 1880	456 57			
	June Quarter, 1880	1,051 45			
	September Quarter, 1880	707 23			
			4,457 10		
C. Stanton	On Account of Expenditure as Treasurer, County of Waterloo,				
	December Quarter, 1879	718 23			
	March Quarter, 1880	559 90			
	June Quarter, 1880	324 75			
	September Quarter, 1880	433 79			
			2,036 67		
W. Reynolds	On Account of Expenditure as Treasurer, County of Wellington,				
	December Quarter, 1879	1,309 03			
	March Quarter, 1880	429 80			
	June Quarter, 1880	1,362 78			
	September Quarter, 1880	443 73			
			3,545 34		
J. T. Stock	On Account of Expenditure as Treasurer, County of Wentworth,				
	December Quarter, 1879	1,152 98			
	March Quarter, 1880	1,097 65			
	June Quarter, 1880	1,045 56			
	September Quarter, 1880	323 04			
			3,619 23		
	Carried forward		105,424 78	65,817 23	285,318 11

ADMINISTRATION OF JUSTICE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	.....	105,424 78	65,817 23	285,318 11
	GENERAL ADMINISTRATION OF JUSTICE IN COUNTIES.—*Continued.*				
J. K. McDonald	On Account of Expenditure as Treasurer, County of York, December Quarter, 1879	805 41			
	March Quarter, 1880	4,183 93			
	June Quarter, 1880	3,865 72			
	September Quarter, 1880	2,799 11			
			11,654 17		
S. B. Harman	On Account of Expenditure as Treasurer, City of Toronto, September Quarter, 1879	663 79			
	December Quarter, 1879	977 38			
	March Quarter, 1880	775 96			
	June Quarter, 1880	470 25			
			2,887 38		
A. Stuart	On Account of Expenditure as Treasurer, City of Hamilton, September Quarter, 1879	368 43			
	December Quarter, 1879	261 26			
	March Quarter, 1880	9 66			
			639 35		
J. W. Murray	*Re* Administration of Justice, Bruce	.....	128 73		
Hon. A. S. Hardy	do Carleton	.....	30 00		
J. W. Murray	do Elgin	.....	324 28		
S. S. Mathews	do Essex	14 50			
Wm. Bains	do do	12 50			
S. S. Macdonell	do do	15 21			
W. Somerville	do do	24 00			
			66 21		
Britton & Whitney	do Frontenac	.....	4 03		
H. McKinnon	do Hastings	.....	125 00		
H. Phair	do Middlesex	39 12			
S. L. Everett	do do	121 50			
S. Peters	do do	70 13			
J. Fisher	do do	15 50			
C. Hutchinson	do do	2,016 85			

J. W. Murray	do	do	497 45			
J. Cameron & Co.	do	do	98 00			
Catholic Record	do	do	16 80			
Tribune	do	do	30 00			
J. A. Harvey	do	do	70 75			
W. T. J. Williams	do	do	24 27			
				3,000 37		
J. W. Murray	do	Muskoka		16 50		
E. Deedes	do	Norfolk		69 09		
J. W. Murray	do	Northumberland and Durham		79 05		
J. E. Farewell	do	Ontario		28 95		
J. W. Murray	do	Prescott and Russell		256 65		
do	do	Perth		30 80		
do	do	Prince Edward		19 00		
J. Fisher	do	Stormont, Dundas, and Glengarry		78 00		
J. W. Murray	do	Victoria		133 96		
do	do	York		390 70		
W. Featherstonhaugh	To pay carriage of Prisoners, different Counties		5,500 00			
J. English	do	do	32 80			
				5,532 80		
					130,919 80	
	SPECIAL SERVICES.					
J. W. Murray	Twelve months' salary as Detective			1,500 00		
J. Duval	Services *re* Leton v. Ritchie			15 00		
Blake, Kerr, Boyd & Cassels	do	Queen v. Gallagher		20 00		
Delamere, Black & Reesor	do	Assessment Roll, Township of Brooke		285 77		
S. S. Macdonell	do	extradition of J. H. Wilson		134 85		
Æ. Irving	do	Donnelly murder		239 80		
do	do	Macdonald Commission		56 00		
C. Buckner	do	Morgan case, Reformatory		9 20		
J. R. Cotter	do	do		5 50		
F. Fenton	do	audit of County York accounts		50 73		
Edgar, Ritchie & Malone	do	Muskoka Mill and Lumber Co.		243 75		
J. M. McTaggart	do	do do		3 53		
J. W. Murray	Accountable warrant *re* extradition of J. Morrison			600 00		
					3,164 13	
	MISCELLANEOUS JUSTICE.					
	Deputy Clerks of the Crown and Pleas.					
T. A. P. Towers	Twelve months' salary as Deputy-Clerk of the Crown and Pleas, Algoma.		100 00			
W. Rubidge	do	Brant	450 00			
W. Gunn	do	Bruce	450 00			
John P. Featherstone	do	Carleton	450 00			
David McLaws	do	Elgin	450 00			
	Carried forward		1,900 00		199,901 16	285,318 11

ADMINISTRATION OF JUSTICE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	1,900 00	.....	199,901 16	285,318 11
	MISCELLANEOUS JUSTICE.—*Continued.*				
	DEPUTY-CLERKS OF THE CROWN AND PLEAS.				
F. E. Marcon	Twelve months' salary as Deputy-Clerk of the Crown and Pleas, Essex..	450 00			
W. H. Fuller	do Frontenac	450 00			
George H. Inglis	do Grey.....	500 00			
J. Mitchell	do Haldimand	400 00			
W. L. P. Eager	do Halton	400 00			
A. G. Northrup	do Hastings	450 00			
D. McDonald	do Huron	500 00			
W. H. Campbell.....	do Kent	450 00			
W. R. Gemmill	do Lambton..	450 00			
C. Rice	do Lanark	450 00			
S. Reynolds	do Leeds and Grenville	500 00			
J. B. McGuin	do Lennox and Addington	400 00			
F. A. B. Clench	do Lincoln	450 00			
J. McBeth	do Middlesex	500 00			
C. C. Rapeljie	do Norfolk	450 00			
R. D. Chatterton	do Northumberland and Durham.....	500 00			
J. V. Ham	do Ontario	450 00			
J. Canfield	do Oxford.....	450 00			
J. A. Austin	do Peel	400 00			
J. Twigg	do Prince Edward.....	400 00			
J. McFadden	do Perth	450 00			
G. T. Leonard.....	do Peterborough	450 00			
J. W. Marston	do Prescott and Russell	358 29			
E. T. Dartnell.....	Acting D. C. and P., 18th October to 24th November..... .	46 47			
John Fraser	do 25th November, 1880	45 24			
A. Thomson	Twelve months' salary as Deputy Clerk of the Crown and Pleas, Renfrew.	400 00			
R. McDonald	do Stormont, Dundas and Glengary	500 00			
J. Mc. L. Stevenson.....	do Simcoe	500 00			
William Grace	do Victoria	450 00			
J. McDougald.....	do Waterloo..	450 00			
I. P. Wilson	do Welland	400 00			

J. Hough	do	Wellington	500 00	
S. H. Ghent	do	Wentworth	500 00	
				15,950 00
		DISTRICT OF ALGOMA.		
R. Carney	Twelve months' salary as Sheriff		1,400 00	
J. M. Hamilton	do	Clerk of the Peace	800 00	
C. J. Bampton	do	Registrar	800 00	
T. A. P. Towers	do	Clerk, District Court	500 00	
R. Carney	On account of expenditure as Treasurer, December Quarter, 1879		637 61	
do	do	do March do 1880	714 25	
do	do	do June do 1880	862 59	
do	do	do September do 1880	1,514 94	
W. D. Lyon	Accountable warrant		400 00	
J. M. Hamilton	Office rent		100 00	
S. G. Wingler	Furnishings		6 84	
J. G. Scott	Subpœnas, etc		4 25	
Hon. A. S. Hardy	Travelling expenses *re* Horne murder		39 00	
Judge Sinclair	do	do	39 25	
				7,818 73
		DISTRICT OF THUNDER BAY.		
R. Laird	Twelve months' salary as Stipendiary Magistrate		1,200 00	
W. D. Lyon	do	do	1,200 00	
John Clark	do	Sheriff	800 00	
C. Kriessman	do	Constable	125 00	
John Cavanagh	do	Deputy Clerk, District Clerk	150 00	
John Craig	Assistant Constable, Silver Islet		125 00	
R. Laird	Account of expenditure, December Quarter, 1879		594 88	
do	do	March do 1880	659 64	
do	do	June do 1880	605 34	
do	do	September do 1880	704 07	
do	Accountable warrants		600 00	
W. D. Lyon	do		400 00	
G. H. Kennedy	Tin boxes for Registrar's office		14 95	
J. W. Goss	Lettering boxes		5 75	
				7,184 63
		DISTRICT OF NIPISSING.		
J. Doran	Twelve months' salary as Stipendiary Magistrate		1,400 00	
E. B. Borron	do		1,200 00	
J. Doran	Account expenditure, December quarter, 1879		117 50	
do	do	March quarter, 1880	122 95	
do	do	June do	119 16	
do	do	September do	140 01	
E. B. Borron	Accountable Warrants		1,100 00	
	Carried forward		4,199 62	30,953 36	199,901 16	285,318 11

ADMINISTRATION OF JUSTICE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	4,199 62	30,953 36	199,901 16	285,318 11
	MISCELLANEOUS JUSTICE.—*Continued.*				
	DISTRICT OF NIPISSING.—*Continued.*				
E. B. Borron	Travelling expenses	149 76			
Hudson's Bay Co.	Supplies	235 77			
P. W. Bell	To pay Voyageurs *re* Administrative Justice	100 00			
			4,843 01		
	DISTRICT OF PARRY SOUND.				
P. McCurry	Twelve months' salary as Stipendiary Magistrate	1,800 00			
do	Account expenditure, December quarter, 1879	165 90			
do	do March do 1880	100 00			
do	do June do do	115 67			
do	do do do do	58 40			
do	do September do do	192 62			
Hart & Rawlinson	Blank forms	24 39			
			2,456 98		
	DISTRICT OF MUSKOKA.				
C. W. Lount	Twelve months' salary as Stipendiary Magistrate	1,800 00			
do	Account expenditure, December quarter, 1879	277 85			
do	do June and September quarter, 1880	191 18			
			2,269 03		
	PROVISIONAL COUNTY OF HALIBURTON.				
A. Niven	Three months' salary as Stipendiary Magistrate	300 00			
J. L. Whiteside	Nine do do	900 00			
do	Account expenditure, September quarter, 1878, to June Quarter, 1880, inclusive	156 25			
do	Account expenditure, September quarter, 1880	12 50			
Hudspeth, Barron & Jackson	Services *re* Division Courts, etc.	75 00			
			1,443 75		

	PROVINCIAL POLICE AT CLIFTON AND FORT ERIE.					
A. G. Hill	Twelve months' salary as Police Magistrate		1,000 02			
M. McDougall	do	Chief of Police	823 50			
T. H. Young	do	Police Constable	732 00			
T. K. Wynn	do	do	549 00			
G. A. McMicking	Nine do	do	403 50			
Anderson & Logan	Uniforms for Police		187 00			
Pierce, Howard & Co.	Office rent		250 00			
Hart & Rawlinson	Stationery		9 25			
Toronto News Co.	do		14 45			
Union Window Shade Co.	Window shades		15 25			
Montreal Telegraph Co.	Telegrams		1 09			
T. H. Young	Travelling expenses		51 88			
M. McDougall	do		5 20			
T. K. Wynn	do		68 95			
G. A. McMicking	do		30 45			
A. G. Hill	Office expenses, express, etc.		213 50			
				4,355 04		
	SHERIFF'S FEES, ETC.					
W. Rubidge	Attendance at Court as D.C.C. & P.	County of Brant	32 50			
W. Gunn	do	Bruce	32 85			
J. P. Featherstone	do	Carleton	73 15			
W. H. Fuller	do	Frontenac	68 75			
G. Inglis	do	Grey	52 75			
D. McLaws	do	Elgin	65 02			
F. E. Marcon	do	Essex	48 48			
W. L. P. Eager	do	Halton	17 40			
A. G. Northrup	do	Hastings	72 87			
J. Mitchell	do	Haldimand	32 20			
D. McDonald	do	Huron	36 50			
W. A. Campbell	do	Kent	49 75			
F. A. B. Clench	do	Lincoln	33 25			
J. B. McGuin	do	Lennox and Addington	36 33			
S. Reynolds	do	Leeds and Grenville	44 40			
J. R. Gemmill	do	Lambton	48 00			
C. Rice	do	Lanark	20 52			
John McBeth	do	Middlesex	76 67			
R. D. Chatterton	do	Northumberland & Durham	73 00			
J. V. Ham	do	Ontario	48 15			
C. C. Rapeljie	do	Norfolk	32 85			
James Canfield	do	Oxford	37 74			
G. T. Leonard	do	Peterboro'	16 34			
J. A. Austin	do	Peel	32 88			
J. Twigg	do	Prince Edward	28 18			
J. W. Marston	do	Prescott and Russell	8 20			
J. McFadden	do	Perth	29 00			
	Carried forward		1,147 73	46,163 31	199,901 16	285,318 11

ADMINISTRATION OF JUSTICE. *Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	1,147 73	46,163 31	199,901 16	285,318 11
	MISCELLANEOUS JUSTICE.—*Continued.*				
	SHERIFF'S FEES, ETC.—*Continued.*				
A. Thompson	Attendance at Court as D.C.C. & P. County of Renfrew	32 45			
R. McDonald	do Stormont, Dundas & Glengarry	21 00			
J. Stevenson	do Simcoe	84 75			
W. Grace	do Victoria	57 00			
I. P. Willson	do Welland	24 76			
J. McDougall	do Waterloo	32 09			
James Hough	do Wellington	68 15			
S. H. Ghent	do Wentworth	160 81			
M. B. Jackson	do York	32 00			
J. Smith	Attendance at Court as Sheriff, County of Brant	88 80			
W. Sutton	do Bruce	168 60			
W. F. Powell	do Carleton	184 60			
J. McEwan	do Essex	71 70			
W. Ferguson	do Frontenac	82 00			
C. H. Moore	do Grey	52 80			
George Taylor	do Hastings	288 10			
R. Davis	do Haldimand	8 00			
Robert Gibbons	do Huron	57 00			
J. A. Woodruff	do Lincoln	91 10			
W. Patrick	do Leeds and Grenville	81 70			
O. T. Pruyn	do Lennox and Addington	29 20			
J. Thompson	do Lanark	96 40			
William Glass	do Middlesex	311 10			
R. N. Waddell	do Northumberland & Durham	75 50			
George Perry	do Oxford	80 00			
N. G. Reynolds	do Ontario	121 70			
Robert Broddy	do Peel	12 80			
James Hall	do Peterboro'	59 60			
J. Hossie	do Perth	99 00			
James Morris	do Renfrew	31 00			

D. E. McIntyre	do	Stormont, Dundas & Glengarry	77 00			
T. D. McConkey	do	Simcoe	117 00			
George Kempt	do	Victoria	74 70			
G. Davidson	do	Waterloo	37 00			
Robert Hobson	do	Welland	8 00			
Hon. A. McKellar	do	Wentworth	220 90			
Hon. P. Gow	do	Wellington	99 50			
F. W. Jarvis	do	York	817 60			
				5,203 14		
		SEALS AND OTHER CONTINGENCIES.				
Rolph, Smith & Co	Division Court Seals		38 35			
C. B. Robinson	Printing		59 51			
Wm. Warwick and Son	Binding		95 28			
Judge Gowan	Expenses *re* Division Court Rules		36 67			
do Jones	do		36 67			
do Hughes	do		36 66			
				303 14		
		REGISTRATION BOOKS.				
Copp, Clark & Co	Registration Books, Thunder Bay		36 00			
J. Huber	do	Muskoka	28 00			
J. Notman	do	Nipissing	37 00			
				101 00		
		MAINTENANCE, OSGOODE HALL.				
Law Society	Allowance for gas, fuel and water		4,250 00			
J. H. Samo	Furniture		4 50			
N. L. Piper	Furnishings		10 79			
W. Adamson & Co	do		19 36			
Wm. Alexander	do		20 00			
M. O'Connor	Glazing, etc		107 70			
W. Alexander	Repairing clocks		20 00			
J. L. Hicks	Locksmithing		5 25			
W. H. Boxall	Tinsmithing		12 18			
G. Duthie	Clearing snow		30 00			
J. Alexander	Sundry payments		248 65			
D. W. Sutherland	do		61 50			
				4,789 93		
		SHORTHAND REPORTING.				
A. J. Henderson	Twelve months' salary as Reporter, Court of Chancery		1,500 00			
Robert Tyson	do	do Queen's Bench	1,500 00			
A. H. Crawford	do	do Common Pleas	1,575 00			
	Carried forward		4,575 00	56,560 52	199,901 16	285,318 11

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	4,575 00	56,560 52	199,901 16	285,318 11
	MISCELLANEOUS JUSTICE.—*Continued.*				
	SHORTHAND REPORTING. *Continued*				
E. E. Horton	Twelve months' salary as Reporter, Court of Appeal	1,500 00			
G. S. Holmsted	To pay sundries	500 00			
M. B. Jackson	do	500 00			
			7,075 00		
	TRAVELLING EXPENSES OF COUNTY COURT JUDGES IN GROUPED COUNTIES.				
His Honour Judge Daniell	Travelling expenses	307 95			
do Davis	do	118 85			
do Deacon	do	16 15			
do Dean	do	51 90			
do Denistoun	do	21 15			
do Elliot	do	131 25			
do Lyon	do	134 00			
do Price	do	218 15			
do Robinson	do	215 20			
do Ross	do	215 00			
do Senkler	do	104 03			
			1,533 63		
				65,169 15	
	Total Administration of Justice				265,070 31
	EDUCATION.				
	PUBLIC SCHOOLS.				
The Treasurer, County of— Brant	Allowance *re* Public Schools	2,251 00			
Bruce	do	6,358 00			

Carleton	do		4,116 00		
Elgin	do		3,971 00		
Essex	do		3,803 00		
Frontenac	do		2,971 00		
Grey	do		7,941 00		
Haldimand	do		2,635 00		
Halton	do		2,153 00		
Hastings	do		4,627 00		
Haliburton	do		696 00		
Huron	do		7,365 00		
Kent	do		4,224 00		
Lambton	do		4,223 00		
Lanark	do		3,051 00		
Leeds and Grenville	do		5,667 00		
Lennox and Addington	do		2,665 00		
Lincoln	do		2,434 00		
Middlesex	do		7,189 00		
Norfolk	do		3,501 00		
Northumberland and Durham	do		6,751 00		
Ontario	do		4,781 00		
Oxford	do		4,365 00		
Peel	do		2,684 00		
Peterborough	do		2,487 00		
Perth	do		4,600 00		
Prescott and Russell	do		3,633 00		
Prince Edward	do		2,198 00		
Renfrew	do		3,929 00		
Simcoe	do		7,880 00		
Stormont, Dundas, and Glengarry	do		6,613 00		
Victoria	do		3,746 00		
Waterloo	do		3,424 00		
Welland	do		2,745 00		
Wellington	do		6,030 00		
Wentworth	do		3,199 00		
York	do		6,382 00		
Hon. the Minister of Educat'n	Amount withheld for Superannuation Subscriptions		26 00		
do do	do	do	24 00		
City of—					
Brantford	Allowance *re* Public Schools		1,297 00		
Belleville	do		1,124 00		
Guelph	do		1,184 00		
Hamilton	do		4,078 00		
Kingston	do		1,427 00		
London	do		2,338 00		
Ottawa	do		1,746 00		
St. Catharines	do		1,086 00		
Toronto	do		8,756 00		
	Carried forward		180,374 00		550,388 42

EDUCATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward ...	180,374 00	.....	.....	550,388 42
	PUBLIC SCHOOLS.—*Continued.*				
The Treasurer, Town of—					
Amherstburgh	Allowance re Public Schools	144 00			
Barrie	do	570 00			
Berlin	do	494 00			
Bothwell	do	146 00			
Bowmanville	do	463 00			
Brampton	do	457 00			
Brockville	do	819 00			
Chatham	do	850 00			
Clifton	do	209 00			
Clinton	do	351 00			
Cobourg	do	592 00			
Collingwood	do	620 00			
Cornwall	do	364 00			
Dundas	do	368 00			
Durham	do	141 00			
Galt	do	570 00			
Goderich	do	574 00			
Harriston	do	214 00			
Ingersoll	do	639 00			
Kincardine	do	500 00			
Lindsay	do	459 00			
Listowel	do	382 00			
Meaford	do	248 00			
Mitchell	do	387 00			
Milton	do	182 00			
Mount Forest	do	254 00			
Napanee	do	444 00			
Niagara	do	198 00			
Oakville	do	211 60			
Orangeville	do	351 00			
Orillia	do	393 00			
Oshawa	do	572 00			
Owen Sound	do	616 00			
Palmerston	do	222 00			
Paris	do	382 00			
Pembroke	do	234 00			

Perth	do		325 00		
Peterboro'	do		667 00		
Petrolia	do		444 00		
Picton	do		349 00		
Port Hope	do		770 00		
Prescott	do		262 00		
Sandwich	do		153 00		
Sarnia	do		453 00		
Seaforth	do		336 00		
Simcoe	do		386 00		
St. Mary's	do		575 00		
St. Thomas	do		893 00		
Stratford	do		1,055 00		
Strathroy	do		500 00		
Thorold	do		275 00		
Tilsonburg	do		255 00		
Walkerton	do		343 00		
Waterloo	do		272 00		
Welland	do		357 00		
Whitby	do		382 00		
Windsor	do		882 00		
Woodstock	do		733 00		
Village of—					
Acton	do		107 00		
Ailsa Craig	do		132 00		
Alliston	do		160 00		
Almonte	do		265 00		
Arkona	do		98 00		
Arnprior	do		163 00		
Arthur	do		119 00		
Ashburnham	do		178 00		
Aylmer	do		209 00		
Aurora	do		197 00		
Bath	do		74 00		
Bayfield	do		81 00		
Beamsville	do		143 00		
Belle River	do		87 00		
Blenheim	do		172 00		
Bobcaygeon	do		96 00		
Bolton	do		86 00		
Bracebridge	do		141 00		
Bradford	do		190 00		
Brighton	do		223 00		
Brussels	do		204 00		
Burlington	do		146 00		
Blyth	do		162 00		
Caledonia	do		165 00		
Cambellford	do		164 00		
Cannington	do		147 00		
Carried forward			209,570 00		550,388 42

EDUCATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	209,570 00			550,388 42
	PUBLIC SCHOOLS.—*Continued.*				
The Treasurer, Village of—					
Cardwell	Allowance *re* Public Schools	114 00			
Carleton Place	do	239 00			
Cayuga	do	114 00			
Chippawa	do	103 00			
Clifford	do	97 00			
Colborne	do	146 00			
Drayton	do	98 00			
Dresden	do	244 00			
Dunnville	do	240 00			
Elora	do	164 00			
Embro	do	62 00			
Exeter	do	242 00			
Fergus	do	213 00			
Fort Erie	do	109 00			
Forest	do	180 00			
Fenelon Falls	do	132 00			
Garden Island	do	82 00			
Glencoe	do	104 00			
Gravenhurst	do	126 00			
Grimsby	do	143 00			
Georgetown	do	230 00			
Gananoque	do	379 00			
Hastings	do	104 00			
Hawkesbury	do	212 00			
Hespeler	do	91 00			
Holland Landing	do	83 00			
Iroquois	do	132 00			
Kemptville	do	165 00			
Kingsville	do	120 00			
Lakefield	do	130 00			
Lanark	do	102 00			
Leamington	do	161 00			
L'Orignal	do	97 00			
London East	do	501 00			
Lucknow	do	169 00			
Lucan	do	153 00			

Madoc	do		123 00		
Markham	do		126 00		
Merrickville	do		118 00		
Merriton	do		138 00		
Midland	do		114 00		
Millpoint	do		166 00		
Morrisburgh	do		258 00		
Newboro'	do		57 00		
Newburg	do		100 00		
Newcastle	do		168 00		
New Edinburgh	do		128 00		
New Hamburg	do		160 00		
Newmarket	do		215 00		
Norwich	do		158 00		
Norwood	do		117 00		
Newbury	do		80 00		
Oilsprings	do		75 00		
Omemee	do		118 00		
Parkdale	do		121 00		
Parkhill	do		193 00		
Pelee Island	do		37 00		
Penetanguishene	do		134 00		
Petersville	do		190 00		
Point Edward	do		167 00		
Portsmouth	do		84 00		
Port Colborne	do		178 00		
Port Dalhousie	do		151 00		
Port Elgin	do		207 00		
Port Perry	do		266 00		
Port Stanley	do		108 00		
Preston	do		210 00		
Paisley	do		138 00		
Port Dover	do		154 00		
Renfrew	do		119 00		
Richmond	do		54 00		
Richmond Hill	do		100 00		
Ridgetown	do		160 00		
Shellburne	do		114 00		
Smith's Falls	do		257 00		
Springfield	do		107 00		
Stayner	do		117 00		
Stirling	do		113 00		
Stouffville	do		108 00		
Streetsville	do		96 00		
Southampton	do		135 00		
Teeswater	do		140 00		
Thamesville	do		98 00		
Thedford	do		84 00		
Tiverton	do		128 00		
	Carried forward		222,091 00		550,388 42

EDUCATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	222,091 00			550,388 42
	PUBLIC SCHOOLS.—*Continued.*				
The Treasurer, Village of—					
Trenton	Allowance *re* Public Schools	223 00			
Uxbridge	do	233 00			
Vienna	do	73 00			
Wallaceburgh	do	89 00			
Wardsville	do	77 00			
Waterdown	do	107 00			
Waterford	do	130 00			
Watford	do	141 00			
Wellington	do	77 00			
Wiarton	do	128 00			
Wingham	do	240 00			
Wyoming	do	128 00			
Wroxeter	do	92 00			
Yorkville	do	678 00			
The Trustees School Section—					
4 Assiginack	do	8 00			
1 Bruce Mines	do	95 80			
4 Foley	do	2 72			
3 Gordon	do	50 55			
1 Hagerman & Croft	do	10 91			
2 Hagerman	do	6 92			
4 McKellar	do	10 26			
5 do	do	3 81			
1 Rutherford	do	43 35			
2 Spence	do	10 99			
Adams, Alp	do	31 30			
Barr, Maggie H	do	16 95			
Blair, Elizabeth M.	do	20 62			
Bowerman, Delia	do	11 20			
Brown, Hamilton	do	68 10			
Beck, Emma	do	6 25			
Chisholm, Margaret A.	do	30 75			
Chapman, Minnie	do	27 30			
Carney, Minnie L	do	32 65			
Cunningham, Alexie V.	do	14 50			
Cairns, Robert H.	do	17 55			

Coulter, Elizabeth J.	do		12 75		
Crassweller, A. H	do		0 80		
Clarkson, Mary	do		8 16		
Carter, Walter L.	do		21 42		
Dickey, William B.	do		26 00		
Duncan, Jessie	do		15 40		
Evans, Edward T.	do		13 94		
Eckhardt, Wilhelmina	do		32 64		
Foster, William C.	do		23 15		
Fleming, Alexander	do		88 69		
Fleming, John	do		7 02		
Harris, Bella J.	do		16 76		
Hodgson, Nettie	do		14 00		
Johnston, Elizabeth A	do		9 33		
Langrell, Edward P.	do		78 11		
Mathewson, William	do		7 02		
McKellar, Kate	do		23 50		
McKinnon, Celia C.	do		14 85		
McNevin, Mary	do		15 38		
McKay, Elizabeth	do		6 61		
Potts, Maggie	do		62 60		
Potts, Barbara	do		17 65		
Pentland, Mary	do		21 20		
Potts, Thomas S.	do		50 08		
Porter, Andrew	do		48 80		
Quin, Jennie	do		9 25		
Russell, Frank G.	do		1 65		
Rowan, Thomas	do		32 22		
Scott, Robert H.	do		28 35		
Stirling, Alice J.	do		16 25		
Stewart, William G.	do		42 70		
Scott, James S.	do		16 68		
Simpson, John G.	do		13 16		
Tully, Annie M.	do		9 18		
Thompson, J. R.	do		19 35		
				225,852 13	
		SEPARATE SCHOOLS.			
The Trustees City of—					
Belleville	Allowance *re* Separate Schools		307 50		
Brantford	do		198 50		
Guelph	do		265 00		
Hamilton	do		889 50		
Kingston	do		620 50		
London	do		449 00		
Ottawa	do		1,637 00		
St. Catharines	do		410 50		
Toronto	do		1,806 50		
	Carried forward		6,584 00		550,388 42

EDUCATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	6,584 00			550,388 42
	SEPARATE SCHOOLS.—*Continued.*				
The Trustees, Town of—					
Amherstburg	Allowance *re* Separate Schools	169 50			
Barrie	do	127 50			
Berlin	do	69 50			
Brockville	do	241 00			
Chatham	do	191 50			
Clifton	do	89 50			
Cobourg	do	139 50			
Cornwall	do	195 50			
Dundas	do	129 50			
Galt	do	74 50			
Goderich	do	59 00			
Ingersoll	do	87 50			
Lindsay	do	312 00			
Mount Forest	do	19 00			
Oakville	do	42 50			
Oshawa	do	77 00			
Owen Sound	do	39 50			
Paris	do	62 00			
Pembroke	do	149 00			
Perth	do	73 00			
Peterboro'	do	264 00			
Picton	do	60 00			
Prescott	do	149 50			
Sarnia	do	127 00			
Stratford	do	216 00			
St. Mary's	do	90 00			
St. Thomas	do	112 50			
Thorold	do	147 00			
Whitby	do	48 50			
Village of—					
Almonte	do	88 50			
Arnprior	do	78 50			
Arthur	do	62 00			
Elora	do	44 00			
Fergus	do	30 50			
Merritton	do	68 50			

Newmarket	do		41 50			
Parkhill	do		36 00			
Port Colborne	do		92 00			
Port Dalhousie	do		60 50			
Portsmouth	do		52 00			
Renfrew	do		49 50			
Trenton	do		90 50			
Wallaceburg	do		55 50			
School Section—						
3 Alfred	do		11 00			
2 Alice	do		15 00			
3, 4 Anderdon	do		48 50			
6 Artemesia & 7 Glenelg.	do		28 00			
6 Arthur	do		56 50			
7 Alfred & 8 South Plantagenet	do		21 00			
4 Asphodel	do		45 50			
10 Asphodel & 17 Percy	do		36 00			
9 Biddulph & 1 McGillivray	do		19 00			
6 Biddulph	do		17 50			
15 (1) Brighton	do		16 00			
3 Bromley (for 1879)	do		28 00			
Brudenell	do					
1 Carrick	do		16 00			
2 Carrick	do		27 50			
1 Cornwall	do		17 50			
7 Colchester	do		29 00			
9 Downie	do		29 00			
2 Edwardsburgh	do		25 00			
7 Ellice	do		20 00			
2 Flamboro' West	do		13 50			
5 Finch	do		39 00			
2 Glenelg	do		19 00			
5 do	do		50 50			
14 Gloucester	do		47 50			
3 Grantham	do		37 00			
1 Grattan	do		75 50			
1 Hagarty & 5 Brudenell	do		36 50			
21 Haldimand	do		19 00			
9 Harwich	do		28 00			
2 Hawkesbury, East	do		36 50			
4 do	do		36 50			
7 do	do		91 50			
15 do	do		30 50			
16 do	do		9 00			
2 Hullett	do		31 00			
3 Holland	do		11 50			
12 Innisfil	do		17 00			
	Carried forward		12,131 00			550,388 42

EDUCATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	12,131 00			550,388 42
	SEPARATE SCHOOLS.—*Continued.*				
The Trustees, School Section—					
8 Kingston	Allowance *re* Separate Schools	20 00			
13 Lancaster	do	19 50			
14 do	do	58 50			
10 Lochiel	do	143 00			
12 do	do	25 00			
4 Maidstone	do	45 00			
3 Malden	do	30 50			
3 (1) do	do	54 00			
3 March	do	35 59			
3,4,5 Moore	do	45 00			
4 Mornington	do	28 00			
7 Nepean	do	23 50			
15 do	do	92 50			
1 Nichol	do	29 00			
5 Normanby	do	11 50			
10 Normanby	do	33 50			
6 Oneida	do	2 50			
1 Orillia	do	69 00			
1 Osgoode	do	34 50			
15 do	do	22 50			
10 Otonabee	do	18 00			
6 Oxford	do				
8 Peel	do	18 50			
12 do	do	40 50			
5 Percy	do	25 50			
12 Percy and Seymour	do	19 50			
8 Plantagenet, North	do	44 00			
9 do	do	43 50			
6 Proton	do	49 50			
4 Raleigh	do	26 00			
5 do	do	30 50			
6 do	do	46 00			
10,17 Richmond	do	15 00			
5 Sheffield	do	52 00			
8 Smith	do	9 50			
5 Sombra	do	43 00			

2 Stafford	do	13 00			
6 Stephen	do	45 00			
7 Sydenham	do	33 50			
14 do	do	23 00			
6 Toronto Gore	do	30 00			
7 Vespra	do	19 50			
17 Walpole	do	5 00			
1 Wawanosh, West	do	21 50			
9,10 Wellesley	do	32 00			
11 do	do	61 00			
12 do	do	18 50			
13 Westminster	do	20 00			
10 Williams, West	do	30 50			
11 Williams, West	do				
15½ Wilmot	do	40 50			
15 do	do				
8 Windham	do	35 00			
1 Wolfe Island	do	16 50			
4 do	do	46 00			
4 Yonge and Escott Rear	do	8 50			
1 York	do	43 50			
6 do	do	30 00			
21 do	do	29 00			
22 do	do	66 00			
			14,102 00		
				239,954 13	

PUBLIC AND SEPARATE SCHOOL INSPECTION.

Agnew, John, M.A	Salary as Inspector		605 00		
Alexander, Wm.	do		360 00		
Ball, J. H	do		473 75		
Barnes, C. A	do		441 25		
Bigg, W. R	do		445 00		
Blair, Rev. Geo., M.A	do		457 50		
Brebner, John	do		427 50		
Brown, Arthur	do		420 00		
Brown, J. C	do		238 75		
Buchan, J. M.	do		42 43		
Burrows, Fred	do		615 00		
Butler, A. F	do		608 75		
Campbell, Alex	do		535 00		
Carlisle, Wm	do		617 50		
Carson, J. S	do		567 50		
Clapp, D. P	do		490 00		
Clendenning, W. S	do		520 00		
Curry, Chas. D., M.D.	do		200 00		
Craig, Jas. J	do		247 75		
Dearness, John Jas	do		575 00		
	Carried forward		8,887 68	239,954 13	550,388 42

EDUCATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		8,887 68	239,954 13	550,388 42
	PUBLIC AND SEPARATE SCHOOL INSPECTION.—*Continued.*				
Dewar, Arch	Salary as Inspector		550 00		
Ferguson, Wm	do		538 75		
Fotheringham, D.	do		531 25		
Garrett, Rev. Thos	do		263 75		
Girardot, Thos	do		322 50		
Grier, Andrew	do		287 50		
Gordon, Thos	do		340 00		
Harrison, E. B.	do		401 25		
Hodgson, Jas	do		583 75		
Johnston, John	do		505 00		
Kelly, M. J., M.D.	do		352 50		
Kinney, R., M.D.	do		405 00		
Knight, J. H.	do		305 00		
Little, R.	do		421 25		
May, Rev. J.	do		600 00		
Mackintosh, W.	do		463 75		
Maxwell, D. A.	do		298 75		
Miller, J. R	do		590 00		
Morgan, J. C.	do		592 50		
Moran, J. M	do		275 00		
Moses, Clark	do		480 00		
McBrien, James	do		622 50		
McDiarmid, D., M.D.	do		435 00		
McKee, Rev. Thos.	do		136 25		
McKee, Rev. W.	do		567 50		
McKinnon, D. J.	do		481 25		
McNaughton, Alex.	do		395 00		
McCaig, Donald	do		109 33		
Nichols, W. N.	do		316 25		
Pearce, Thos.	do		615 00		
Platt, G. D.	do		436 25		
Reazin, H.	do		629 25		
Scarlett, E	do		615 00		
Scott, R. G., B.A.	do		637 50		
Slack, H. S.	do		305 00		
Smith, Jos. H	do		498 75		

Somerset, J. B.	do		417 50		
Somerville, G. A.	do		76 67		
Steele, T. O.	do		280 00		
Switzer, P. A.	do		1,671 07		
Tilley, Jno. J.	do		592 50		
Wadsworth, J. J., M.D.	do		617 50		
C. B. Robinson	Printing		423 76		
Wm. Warwick & Son	do		203 00		
Jas. Greene	do		30 00		
J. Notman	Stationery		13 50		
J. M. Buchan	Travelling Expenses		16 39		
J. G. Hodgins	do		28 95		
Wm. McIntosh	Services outlying districts		75 00		
W. S. Clendenning	do		50 00		
Express Co'y	Charges		55		
Dominion Telegraph Co'y	Telegrams		82		
A. Piddington	Postage Stamps		131 00		
J. L. Capreol	Fees for subpœneas		10 95		
W. H. Atkinson	To pay sundries		2 60		
H. M. Wilkinson	To pay sundries		5 95		
G. W. Lount	Serving subpœneas		36 25		
				29,478 97	
	POOR SCHOOLS.				
The Treasurer, County of Bruce	Allowance *re* Poor Schools		172 00		
Elgin	do		76 50		
Essex	do		25 00		
Frontenac	do		95 00		
Haliburton	do		890 55		
Hastings	do		130 00		
Kent	do		40 00		
Leeds & Grenville	do		103 00		
Lanark	do		60 00		
Lennox & Addington	do		323 00		
Northumberland & Durham	do		51 50		
Ontario	do		280 00		
Perth	do		198 75		
Renfrew	do		1,596 00		
Simcoe	do		1,555 50		
Victoria	do		2,953 50		
Wentworth	do		42 50		
Wellington	do		157 00		
The Trustees School Section—1 Assignack	do		55 00		
2 do	do		40 00		
2 do	do		85 00		
3 do	do		50 00		
	Carried forward		8,979 80	269,433 10	550,388 42

EDUCATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		8,979 80	269,133 10	550,388 42
	POOR SCHOOLS.—*Continued.*				
4 Assignack	Allowance re Poor Schools		80 00		
4 do	do		45 75		
1 Bruce Mines	do		39 70		
1 Billings & Cellan	do		68 00		
1 Chapman & Croft	do		51 00		
2 Chapman	do		63 75		
1 Christie	do		72 25		
1 Carling & Ferguson	do		68 00		
1 Carnarvon	do		100 00		
2 do	do		68 00		
1 Ferguson & McDougall	do		68 00		
1 Foley	do		34 50		
2 do	do		85 00		
4 do	do		85 00		
1 Gordon	do		70 00		
2 do	do		57 00		
1 do	do		85 00		
1 Howland	do		50 00		
2 do	do		50 00		
3 do	do		57 00		
1 Hagerman & Croft	do		63 75		
2 Hagerman	do		76 50		
3 do	do		85 00		
1 Lefroy & Plummer	do		100 00		
1 do	do		63 75		
1 Monteith	do		85 00		
3 McDougall	do		28 00		
3 McMurrich	do		85 50		
1 McKellar	do		59 50		
4 do	do		59 50		
5 do	do		63 75		
2 McDougall & McKellar	do		55 25		
1 Nipissing	do		85 00		
1 Prince	do		42 50		
1 Rutherford	do		63 75		
1 do	do		80 00		

1 Ross & Plummer	do		63 75		
1 do	do		75 00		
1 Ryerson	do		63 75		
2 do	do		63 75		
3 do	do		57 00		
1 Spence & Ryerson	do		63 75		
2 Spence	do		76 50		
1 St. Joseph	do		68 00		
1 St. Joseph's Island	do		80 00		
1 Sandfield	do		68 00		
1 do	do		80 00		
Sault Ste. Marie Schools	do		43 00		
Shuniah Schools	do		62 00		
1 Tehkummah	do		80 00		
2 do	do		60 00		
1 do	do		45 75		
2 do	do		85 00		
3 do	do		85 00		
1 Thessalon	do		85 00		
1 Wallbridge	do		85 00		
Chapman, Minnie, Teacher	do		42 50		
Calder, Jane, do	do		12 00		
Carney, Minnie, do	do		42 50		
Cairns, R. H., do	do		68 00		
Foster, Thomas, do	do		57 00		
Hill, Rev. R., do	do		23 00		
Knight, Cameron, do	do		57 00		
Potts, Barbara, do	do		42 50		
Porter, Andrew, do	do		63 75		
Pentland, Mary, do	do		63 75		
Potts, Thomas, do	do		34 50		
Russell, Frank G., do	do		57 00		
Stirling, Alice J., do	do		59 50		
Stewart, W. J., do	do		55 25		
Summers, Helen, do	do		57 00		
				13,500 00	
	HIGH SCHOOLS AND COLLEGIATE INSTITUTES.				
The Treasurer, County of—					
Brant	Allowance *re* High Schools and Collegiate Institutes		544 85		
Bruce	do		1,226 84		
Essex	do		930 00		
Elgin	do		2,524 08		
Frontenac	do		620 40		
Grey	do		653 25		
Haldimand	do		1,780 50		
Halton	do		530 23		
Hastings	do		799 37		
	Carried forward		9,609 52	282,933 10	550,388 42

EDUCATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		9,609 52	282,933 10	550,388 42
	HIGH SCHOOLS AND COLLEGIATE INSTITUTES.—*Continued.*				
The Treasurer, County of—					
Huron	Allowance *re* High Schools and Collegiate Institutes		2,444 06		
Kent	do		702 75		
Lambton	do		691 55		
Lanark	do		3,316 25		
Leeds and Grenville	do		2,438 12		
Lincoln	do		2,088 07		
Lennox and Addington	do		1,141 58		
Middlesex	do		1,850 53		
Northumberland and Durham	do		5,238 54		
Norfolk	do		1,931 74		
Ontario	do		2,973 13		
Oxford	do		1,316 99		
Peel	do		1,224 29		
Perth	do		4,156 35		
Peterborough	do		2,477 56		
Prescott and Russell	do		1,157 04		
Prince Edward	do		664 07		
Renfrew	do		2,002 51		
Simcoe	do		4,428 50		
Stormont, Dundas and Glengarry	do		3,035 91		
Victoria	do		1,819 41		
Waterloo	do		2,062 42		
Welland	do		1,865 14		
Wellington	do		2,829 25		
Wentworth	do		1,285 87		
York	do		2,367 92		
City of—					
Brantford	do		2,106 97		
Guelph	do		823 32		
Hamilton	do		2,786 63		
Kingston	do		1,493 44		
London	do		1,756 64		
Ottawa	do		1,599 15		
St. Catharines	do		2,158 83		

Belleville	do			456 25	
Toronto	do			2,035 86	
Town of Prescott	do			568 69	
					82,904 85
	INSPECTION OF HIGH SCHOOLS AND COLLEGIATE INSTITUTES.				
J. A. McLellan	Twelve months' salary and travelling expenses			2,400 00	
J. M. Buchan	do	do		2,375 00	
S. A. Marling	do	do		2,375 00	
A. Brown	Travelling expenses, etc.			12 25	
C. B. Robinson	Printing			137 59	
W. Warwick & Son	Binding			5 56	
James Green	Printing			30 00	
A. Piddington	Postage Stamps			20 00	
Express Company	Charges			1 10	
					7,356 50
	DEPARTMENTAL EXAMINATIONS.				
Rev. G. P. Young	Services as Chairman of Central Committee of Examiners		650 00		
J. A. McLellan	do	Examiner	300 00		
J. M. Buchan	do	do	300 00		
J. A. Marling	do	do	300 00		
J. C. Glashan	do	do	300 00		
J. J. Tilley	do	do	300 00		
G. W. Ross	do	do	300 00		
S. Hughes	do	do	300 00		
James Greene	do	Printer	600 00		
				3,350 00	
A. Baker, M.A	Services as Sub-Examiner		118 05		
J. Brown, M.A	do		133 92		
W. J. Loudon, B.A	do		125 00		
G. B. Sparling, M.A	do		134 91		
A. M. Lafferty, M.A	do		139 95		
F. E. Hayter, B.A	do		91 34		
A. R. Bain, M.A	do		137 63		
W. McBride, B.A	do		129 50		
Thos. Gilmour, B.A	do		50 19		
J. McDougall, B.A	do		125 99		
J. D. Cameron, B.A	do		130 24		
J. A. Culham, M.A	do		137 89		
D. B. McTavish, M.A	do		136 98		
Geo. Inglis, B.A	do		123 01		
A. Johnston, M.A	do		125 99		
A. B. Baird, B.A	do		126 98		
A. Dawson, M.A	do		126 98		
J. F. Ferguson, M.A	do		125 99		
	Carried forward		2,220 54	3,350 00	373,194 45

EDUCATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	2,220 54	3,350 00	373,194 45	550,388 42
	DEPARTMENTAL EXAMINATIONS.—*Continued.*				
Rev. Septimus Jones, M.A.	Services as Sub-Examiner	128 96			
A. G. Leonard, B.A	do	114 08			
T. H. Redditt, B.A	do	128 97			
W. Dale, M.A	do	118 30			
Rev. C. H. Mockridge, M.A.	do	128 49			
W. Donald, M.A	do	130 97			
J. H. Panton, M.A	do	125 02			
Dr. Mills	do	112 11			
J. A. Peterson, M.A	do	125 99			
A. Hay	do	133 01			
J. L. Davidson, B.A	do	148 27			
A. H. Reynar, M.A	do	135 64			
S. C. Smoke, M.A	do	131 08			
Rev. F. H. Wallace, M.A	do	125 99			
Rev. G. M. Milligan, M.A	do	125 99			
W. Warwick & Son	Printing	165 44	4,133 41		
C. B. Robinson	do	274 54			
James Greene	do	77 00			
J. Notman	Stationery	371 71	516 98		
Educational Depository	do	124 14			
Dominion Type Foundry	Type		495 85		
Copp, Clark & Co	Books, etc	14 58	49 36		
G. Furnival	Printing Music	1 50			
J. Campbell & Son	Examination books	13 79			
Hart & Rawlinson	Books	5 23			
A. Piddington	Postage stamps	38 00	35 10		
Montreal Telegraph Co	Telegrams	16 69			
J. P. Wagner	Lumber	2 10	54 69		
P. Paterson & Son	Hardware	3 07			
W. J. McCleary	Carpentering	14 56			
			19 73		

Geo. Ringham	Tinsmithing	3 00			
W. H. Sparrow	Furnishings	1 75			
			4 75		
Water-Works	Water	60 00			
G. B. Stock	Oil	1 20			
W. Burns & Co	Ice	6 00			
T. McConnell & Co	Wood	23 75			
Consumers' Gas Co	Gas	14 53			
			105 48		
Express Company	Charges	4 90			
H. M. Wilkinson	Express	6 66			
			11 56		
T. H. Gilmour	Services as Sub-Examiner		80 00		
J. M. Buchan	Travelling expenses	98 85			
J. J. Tilley	do	231 90			
G. W. Ross	do	106 00			
J. C. Glashan	do	66 21			
J. A. McLellan	do	15 65			
			518 61		
				9,375 52	

TRAINING OF TEACHERS.

President of Teachers' Association County of—					
Bruce	Allowance *re* Training of Teachers	125 00			
Brant	do	50 00			
Carleton	do	50 00			
Dundas	do	50 00			
Durham	do	50 00			
Elgin	do	75 00			
Essex	do	100 00			
Frontenac	do	50 00			
Glengarry	do	50 00			
Grenville	do	50 00			
Grey	do	100 00			
Huron	do	100 00			
Haldimand	do	50 00			
Hastings	do	100 00			
Halton	do	50 00			
Kent	do	150 00			
Lambton	do	100 00			
Lanark	do	100 00			
Leeds	do	100 00			
Lennox and Addington	do	50 00			
Lincoln	do	25 00			
Middlesex	do	100 00			
Muskoka	do	50 00			
Norfolk	do	50 00			
Northumberland	do	100 00			
	Carried forward	1,875 00		382,569 97	550,388 42

EDUCATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	1,875 00		382,569 97	550,388 42
	TRAINING OF TEACHERS.—*Continued.*				
President of Teachers' Association, County of					
Ontario	Allowance re Training of Teachers	75 00			
Oxford	do	50 00			
Peel	do	50 00			
Perth	do	150 00			
Prince Edward	do	50 00			
Parry Sound	do	50 00			
Prescott	do	50 00			
Peterborough	do	50 00			
Renfrew	do	100 00			
Russell	do	50 00			
Simcoe	do	50 00			
Stormont	do	50 00			
Victoria	do	100 00			
Welland	do	50 00			
Wellington	do	50 00			
Waterloo	do	50 00			
Wentworth	do	50 00			
York	do	50 00			
City of					
Toronto	do	100 00			
Kingston	do	100 00			
London	do	50 00			
Ottawa	do	25 00			
			3,275 00		
Trustees of County Model Schools, County of					
Brant	do	200 00			
Bruce	do	500 00			
Carleton	do	200 00			
Dundas	do	200 00			
Durham	do	200 00			
Elgin	do	200 00			
Essex	do	200 00			
Grey	do	300 00			
Glengarry	do	200 00			
Haldimand	do	200 00			
Huron	do	400 00			

Hastings	do		300 00		
Halton	do		200 00		
Kent	do		200 00		
Leeds	do		400 00		
Lambton	do		400 00		
Lennox and Addington	do		200 00		
Lanark	do		200 00		
Lincoln	do		200 00		
Middlesex	do		200 00		
Northumberland	do		200 00		
Norfolk	do		200 00		
Oxford	do		400 00		
Ontario	do		400 00		
Peel	do		200 00		
Prince Edward	do		200 00		
Prescott	do		300 00		
Perth	do		200 00		
Renfrew	do		200 00		
Simcoe	do		300 00		
Stormont	do		200 00		
Victoria	do		200 00		
Waterloo	do		400 00		
Welland	do		200 00		
Wellington	do		300 00		
York	do		400 00		
City of—					
Hamilton	do		200 00		
Kingston	do		200 00		
London	do		200 00		
				10,000 00	
Hon. S. C. Wood	To pay travelling expenses of Normal School Students			4,684 11	
J. J. Tilley	Services, Inspecting County Model Schools		289 10		
G. W. Ross	do do		510 00		
F. Bisset	Travelling expenses		30 00		
W. R. Bigg	Services *re* P. Kingston, Investigation		19 00		
				848 10	
C. B. Robinson	Printing		54 07		
W. Warwick & Son	Binding		248 81		
A. Piddington	Postage Stamps		166 00		
J. Greene	Printing		42 80		
G. G. S. Lindsey	Advertising		12 60		
				524 28	19,331 49
	SUPERANNUATED TEACHERS.				
Hon. S. C. Wood	Payments to Superanuated Teachers			42,093 23	
C. B. Robinson	Printing		96 05		
W. Warwick & Son	Binding		2 22		
				98 27	
Sundry Physicians	Medical expenses			204 50	
					42,396 00
	Carried forward				444,297 46	550,388 42

EDUCATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward			444,297 46	550,388 42
	NORMAL AND MODEL SCHOOLS, TORONTO.				
	Salaries.				
Rev. H. W. Davies	Twelve months' salary as Principal		2,000 00		
T. Kirkland	do Science Master		1,800 00		
J. Carlyle	do Mathematical Master		1,500 00		
S. Clare	do Writing and Bookkeeping Master		1,000 00		
W. Armstrong	do Drawing Master		600 00		
H. F. Sefton	do Music Master		500 00		
Mrs. F. T. Graham	Ten do Teacher of Elocution		375 00		
C. R. Dearnly	Twelve do Gymnastic Master		300 00		
Wm. Scott	do Head Master, Boys' Model School		1,200 00		
J. L. Davison	do First Assistant, do		1,000 00		
S. M. Dorland	do Second do do		900 00		
P. N. Davey	do Third do do		800 00		
M. Cullen	do Head Mistress, Girls' Model School		1,000 00		
K. Hagarty	do First Assistant do		800 00		
E. Carter	Eight do Second do do		466 66		
M. Hunt	Four do do do		233 34		
M. Hunt	Eight do Third do do		433 32		
J. Meneilley	Four do do do		216 68		
E. W. D. Butler	Ten do Clerk of Normal and Model Schools		450 00		
James Forsyth	Four do Head Gardener		136 66		
J. F. Barron	Eight do do		273 34		
R. McCallum	Twelve do First Engineer		410 00		
J. Abraham	do Second do		400 00		
H. Beesley	do Third do		360 00		
C. Armstrong	do Janitor, Normal School		450 00		
J. Moore	do do Model School		420 00		
H. Blunt	do do do		400 00		
R. Gilpin	do Assistant Gardener		400 00		
D. C. Bell	Services as Teacher of Elocution		150 00		
				18,975 00	
	Expenses.				
C. B. Robinson	Printing	70 02			
J. Greene	do	33 16			

Wm. Warwick & Son	Binding	23 62			
			126 80		
Hart & Rawlinson	Books, etc	146 95			
Copp, Clark & Co	do	80 68			
Wesleyan Book Room	do	5 00			
Willing & Williamson	do	5 25			
W. A. McLean	do	2 00			
McLean, Roger & Co	do	2 50			
D. Appleton & Co	Book	0 75			
Education Depository	Stationery	237 66			
J. Notman	do	47 10			
Might & Taylor	Directory	2 50			
A. Piddington	Postage stamps	4 50			
Sundry Newspapers	Subscriptions and advertisements	31 00			
A. H. Paull	Refilling printograph	1 50			
			567 39		
Consumers' Gas Co	Gas	21 53			
Water-Works	Water	271 59			
J. McCormack	Wood	100 00			
H. B. Rathbun & Son	Fuel	925 95			
			1,319 07		
Hugh Miller & Co	Paints, chemicals, etc	191 70			
Lyman Bros. & Co	do	4 22			
			195 92		
George Ringham	Tinsmithing	31 20			
C. Shipway	do	2 00			
Smith & Walsh	Plastering	23 35			
Ritchie & Co	Plumbing	195 82			
R. H. Lear	do	43 20			
W. J. McCleary	Carpentering	345 97			
H. S. Alexander & Son	Painting, etc	18 90			
M. O'Connor	do	151 45			
			811 89		
Robinson Bros	Furnishings	8 00			
B. H. Palmer	do	5 00			
W. H. Sparrow	do	29 13			
H. G. Strathern	do	11 88			
C. T. Whatmough	do	28 65			
C. Page & Sons	do	7 22			
H. A. Nelson	do	50 79			
H. Graham & Co	do	45 46			
			186 13		
J. P. Wagner	Lumber	96 02			
Hillock & Kent	do	62 80			
Chase Bros. & Bowman	do	0 75			
Rice & Son	Hardware	13 59			
Wm. Hewitt & Co	do	93 35			
Hatch & Bro	do	1 02			
P. Paterson	do	5 55			
	Carried forward	273 08	3,207 20	463,272 46	550,388 42

EDUCATION.—*Continued.*

TO WHOM PAID.	SERVICE	$ c.	$ c.	$ c.	$ c.
	Brought forward	273 08	3,207 20	463,272 46	550,388 12
	NORMAL AND MODEL SCHOOLS, TORONTO. *Continued.*				
	EXPENSES.				
G. Pearsall	Shears	1 00			
W. H. Rice	Wire gates, etc	13 00			
			287 08		
J. T. Brown	Allowance for rent		34 00		
H. M. Wilkinson	Sundry payments		19 60		
J. & T. Teevan	Repairing garden implements	5 00			
Brimstin & Bro.	Repairing locks	51 54			
C. Potter	Repairing desks, etc	12 00			
G. Pollay	Repairing flag	3 00			
			71 54		
William Rennie	Seeds and plants, etc	83 17			
J. A. Simmers	Seeds	1 00			
J. Ross	Trees	8 00			
J. Davis	Flower pots	66 40			
R. L. Cowan	Gravel	8 75			
J. Stewart	Potting soil, etc	15 00			
P. Falbie	Manure	6 00			
J. E. Lightfoot	Sand	1 59			
R. A. Fraser	Work on grounds	11 00			
Stewart & Falbie	Teaming	11 50			
W. Harris	Cartage	3 00			
Campbell & Co	Filters	16 00			
J. M. Hamilton	Awning cloth	6 30			
J. B. Smith	Blinds	3 50			
O'Keefe & Co	Barrels	1 60			
Express Co.	Charges	0 65	243 37		
G. Duthie	Clearing snow	15 00			
R. McCartney	Cleaning M. School	4 00			
R. Gilpin	Washing towels, etc	16 80			
J. Abraham	do	16 80			
C. Armstrong	do	27 60			
			80 20		
				3,942 99	

NORMAL SCHOOL, OTTAWA.

Salaries.

J. A. McCabe	Twelve months' salary as	Principal		2,000 00	
G. Baptie	do	Science Master		1,500 00	
M. E. Mosher	Eight do	Teacher of Elocution		300 00	
D. C. Bell	Four do	do		150 00	
M. Sparrow	Twelve do	Drawing Master		466 65	
W. G. Workman	do	Music Master		333 32	
E. B. Cope	do	Clerk and Accountant		600 00	
do	do	Drill Instructor		250 00	
W. Brethour	do	First Engineer and Gardener		600 00	
L. Williams	do	Second Engineer and Gardener		425 00	
R. McCann	do	Janitor		360 00	
do	do	Scrubbing, etc		150 00	
T. Mooney	do	Labourer		300 00	
E. D. Parlow	Four do	Head Master, Model School		333 33	
E. Payne	do	First Assistant, do		266 66	
W. Alford	do	Second do do		233 33	
A. Sherrick	do	Head Mistress, do		266 66	
J. M. Musgrove	Three do	Writing and Book-keeping		125 00	
M. Cussack	Four do	First Assistant Mistress		216 66	
M. G. Joyce	do	Second do		183 33	
H. R. McDonald	do	Caretaker and Janitor		170 00	
					9,229 94

Expenses.

C. B. Robinson	Printing	91 21		
William Warwick & Sons	do	58 81		
J. Notman	Stationery	155 14		
Education Depository	do	55 65		
			360 81	
H. S. Alexander & Son	Painting	11 10		
J. Leslie	Repairing clock	9 00		
			20 10	
Gas Company	Gas	51 80		
Water-works	Water	226 26		
John Heney	Wood	144 25		
George McCullough	Fuel	1,110 42		
			1,532 73	
Wilson & Son	Furnishings	5 00		
Stewart Bros	do	6 00		
W. Chalmers	do	12 55		
D. Campbell	do	10 01		
Topley studio	Photographs of public men	42 09		
J. B. Carter	Laboritories, etc	164 50		
Russell and Allan	Furnishings	11 74		
	Carried forward	251 89	1,913 64	476,445 39

EDUCATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	251 89	1,913 64	476,445 39	550,388 42
	NORMAL SCHOOL, OTTAWA.—*Continued.*				
	EXPENSES.—*Continued.*				
Blyth & Kerr	Furnishings	55 95			
Kavanagh Bros.	do	18 75			
C. Page & Sons	do	20 05			
J. Kay	Carpeting	66 15			
Schoolbred & Co.	Furniture, etc	52 50			
R. Hay & Co.	do	18 00			
Hugh Miller & Co.	Brushes, etc	10 80			
G. Harrison	Glassware	14 80			
Mason & Risch	Cabinet organ	130 00			
J. J. Griffiths & Son	Apparatus	75 93			
Steele Bros. & Co.	Seeds	2 30	714 82		
J. Leslie & Sons	Trees	26 95			
T. Elmith	Plants	3 60			
Ewing Bros	do	12 60			
Sundry newspapers	Subscription and advertising	58 50	45 45		
Hart & Rawlinson	Subscription to magazines	104 72			
J. H. Alexander	Books	25 00	163 22		
Copp, Clark & Co.	do	372 92			
McLean, Roger & Co.	do	2 50			
Wesleyan Book Room	do	5 00			
Grand Trunk Railway	Freight	9 12	405 42		
St. Lawrence & Ottawa Ry.	do	58 02			
Dominion Telegraph Co.	Telegrams	6 66			
Express Co.	Charges	90 95			
J. Hope & Co.	Postage stamps	45 90	164 75		
Postmaster	Rent of box	12 00			
J. G. Hodgins	Travelling expenses	36 00	57 90		
D. C. Bell	Expenses, removal to Ottawa	20 00			
			56 00		

Board of Public School Trustees	Use of City Schools for Normal School Students		1,000 00		
H. M. Wilkinson	Sundry payments	4 49			
J. A. McCabe	do	20 45			
			24 94		
				4,546 14	
	MUSEUM AND LIBRARY.				
Hunter, Rose & Co	Printing, etc	91 85			
C. B. Robinson	do	15 56			
W. Warwick & Son	Binding	113 21			
Woodward, Grant & Co	Engraving	14 50			
Grant, Barfoot & Co	do	8 00			
Rolph, Smith & Co	Rubber stamps	8 00			
			551 12		
Topley studio	Photographs of public men	48 50			
R. Watson	Medallions, etc	8 75			
F. Dunbar	Busts	20 00			
			77 25		
F. W. Coate & Co	Books	23 75			
Hart & Rawlinson	do	15 00			
McLean, Roger & Co	do	2 50			
D. Appleton & Co	do	6 75			
J. M. Lemoine	do	8 00			
J. H. Alexander	do	25 00			
J. H. Anderson	do	25 00			
J. B. Magurn	do	3 00			
Wesleyan Book Room	do	5 06			
Rowsell & Hutchison	Law reports	12 36			
Willing & Williamson	do	10 00			
Newspapers	Subscriptions	21 75			
J. Notman	Stationery	4 88			
			162 99		
Ritchie & Co	Plumbing	35 50			
H. Brimstin	Locksmithing	1 00			
Anderson & Nesbit	Zinc plates, etc	27 58			
C. Elkington	Carpentering	286 08			
W. J. McLeary	do	1 90			
			352 06		
W. Hewitt & Co	Hardware	7 16			
H. Graham & Co	Oil cloth	15 60			
B. H. Palmer	Brushes	5 00			
A. Campbell & Co	Filters	8 00			
W. H. Rice	Wire grates	30 00			
			65 76		
H. Miller & Co	Chemicals, etc	44 57			
Elliot & Co	do	10 80			
			55 37		
	Carried forward		1,264 55	480,991 53	550,388 42

EDUCATION.—*Continued.*

TO WHOM PAID.	SERVICE	$ c.	$ c.	$ c.	$ c.
	Brought forward		1,264 55	480,991 53	550,388 42
	MUSEUM AND LIBRARY.—*Continued.*				
T. McConnell & Co	Wood	40 00			
H. B. Rathbun & Son	Fuel	350 00			
Consumers' Gas Co	Gas	16 33			
Water-works		92 39			
			498 72		
J. H. Samo	Furniture	11 00			
R. Moir	Battery crocks	1 25			
Dorrien Plating Co	do plates	4 50			
			19 75		
Express Co	Charges		7 95		
V. Casci	Repairing statues	5 00			
T. Arch	do	13 50			
			18 50		
W. J. Graham	Office cleaning	12 00			
do	Services as caretaker	100 00			
H. M. Wilkinson	Sundry payments	9 72			
			121 72		
				1,931 19	
	EDUCATIONAL DEPOSITORY.				
	STOCK.				
Dominion Plumbago Co	Pencils	40 04			
C. Potter	Apparatus	25 50			
Brown Bros	Straw boards	68 75			
Moir & McCaul	Mineral frames	140 00			
G. Barton	Map frames	45 00			
Dorrien Plating Co	Battery plates	4 50			
			323 79		
J. Roberts	Chemicals	32 13			
H. Miller & Co	do	431 10			
			463 23		
F. Warren & Co	Supplies		0 80		
Dominion Telegraph Co	Telegrams	1 29			
Hunter, Rose & Co	Binding	615 83			

W. Warwick & Son	do	25 48			
C. B. Robinson	Printing	8 92			
James Greene	do	8 00			
J. Notman	Stationery	82 20			
Educational Depository	Postage stamps	5 50			
H. M. Wilkinson	Sundries	1 83			
			749 05		
J. B. Carter	Mounting maps, laboratories, etc	1,790 73			
H. Hoch	Colouring maps	116 80			
S. P. May	do	129 55			
Fulton Manufacturing Co	Map stretcher	1 00			
J. J. Griffin & Co	Apparatus	414 75			
Woodward, Grant & Co	Engraving seal	27 00			
Rolph, Smith & Co	Seals	19 00			
Grant, Barfoot & Co	Engraving seal	22 50			
Copp, Clark & Co	Tracing maps	92 00			
			2,613 33		
W. J. McCleary	Carpentering		22 20		
Thomas Arch	Repairing statues		4 00		
G. Rutledge	Books	2 11			
W. J. Gage & Co	do	37 80			
J. Campbell & Co	do	361 37			
Hunter, Rose & Co	do	291 14			
J. Lemoine	do	1 00			
W. J. Gage & Co	do	286 16			
William Warwick & Son	do	576 99			
Copp, Clark & Co	do	828 80			
J. Roberts	do	104 66			
W. & R. Chambers	do	24 04			
C. Griffin & Co	do	28 06			
McMillan & Co	do	172 65			
Cassell, Peter & Galpin	do	232 14			
W. P. Nimmo	do	266 57			
Ward, Lock & Tyler	do	86 74			
Longmans, Green & Co	do	121 06			
G. Rutledge & Son	do	177 17			
T. Warren & Co	do	207 84			
J. J. Alworth	do	8 88			
J. Vanevar	do	1 20			
			3,816 38		
Grand Trunk Railway	Freight	19 07			
Neil Meehan	Cartage	32 56			
A. R. McPherson, Ross & Co	To pay freight	120 57			
American Express Co	Charges	17 45			
William Oliphant	Carriage of goods	3 18			
Custom House	Duties	184 90			
			377 73		
Hon. S. C. Wood	Sundry payments to School Trustees, etc., *re* purchase of books		3,771 78		
				12,142 29	
	Carried forward			495,065 01	550,388 42

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward			495,065 01	550,388 42
	EDUCATIONAL DEPOSITORY.—*Continued.*				
	SALARIES.				
S. P. May	Twelve months' salary as Superintendent		1,400 00		
H. M. Wilkinson	do Cashier		1,000 00		
S. A. May	do Despatch Clerk		520 00		
R. J. Bryce	do Senior Clerk		500 00		
W. N. Sweeten	Six do do		225 00		
R. L. Cathron	Twelve do do		450 00		
F. H. Evans	Six do do		175 00		
W. H. Canniff	Twelve do Junior Clerk		350 00		
John Davison	Six do do		150 00		
W. S. Dickey	Eight do do		166 66		
W. Lemon	Twelve do Messenger and packer		363 75		
W. N. Sweeten	On account of gratuity		244 00		
F. H. Evans	do		132 00		
				5,676 41	
	EXPENSES.				
J. Greene	Printing	80 00			
C. B. Robinson	do	205 73			
Hunter, Rose & Co	do	666 23			
W. Warwick & Son	Binding	51 59			
			1,003 55		
A. Piddington	Postage stamps and cards	124 58			
do	Postage stamps	131 35			
J. Notman	Stationery	190 51			
			446 44		
T. McConnell & Co	Wood	30 00			
H. B. Rathbun & Son	Fuel	350 00			
Consumers' Gas Co	Gas	19 55			
W. Burns & Co	Ice	6 00			
Water-works	Water	50 00			
			455 55		
Ritchie & Co	Plumbing	190 33			
do	do	24 50			
H. Brimstin	Locksmithing	18 25			

W. J. McCleary	Carpentering	43 98			
J. H. Samo	Repairing desk	2 00			
M. O'Connor	Glazing	100 00			
			379 06		
H. Miller & Co	Chemicals		3 05		
W. Hewitt & Co	Cash-boxes		4 83		
P. Paterson & Son	Furnishings	6 55			
C. T. Whatmough	do	3 25			
G. Clatworthy	Sash-fasteners	3 00			
W. J. Graham	Flour for paste	4 50			
			17 30		
J. McRobert	Hay		2 82		
Express Co	Charges	25 28			
Neil Meehan	Cartage	33 77			
Collector of Customs	Duties	13 35			
			72 40		
Sundry newspapers	Subscriptions		38 35		
H. M. Wilkinson	Sundry payments		57 15		
				2.480 50	
	MISCELLANEOUS.				
J. W. Connor, M.A	Revision of Text-books		400 00		
C. B. Robinson	Printing		331 59		
W. Warwick & Son	Binding		877 84		
J. Notman	Stationery		273 51		
				1,882 94	
	Total Education				505,104 86

PUBLIC INSTITUTIONS MAINTENANCE.

ASYLUM FOR THE INSANE, TORONTO.

D. Clark, M.D	Twelve months' salary as Medical Superintendent	2,000 00	
S. Lett, M.D.	do do Assistant do	1,000 00	
C. K. Clarke, M.D	Nine do do Physician	599 97	
T. S. Covernton, M.D.	Three do do do	200 03	
T. J. Tracy	Twelve do Bursar	1,700 00	
Wm Tracy	do do Bursar's Clerk	500 00	
C. Gibbs	do do Store-keeper	600 00	
R. Blair	do do Steward	700 00	
M. A. Parks	do do Matron	400 00	
E. Parks	do do Assistant Matron	192 00	
	Carried forward	7,892 00	1,055,493 28

PUBLIC INSTITUTIONS MAINTENANCE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	7,892 00			1,055,493 28
	ASYLUM FOR THE INSANE, TORONTO.—*Continued.*				
J. Baird	Twelve months salary as Tailor	500 00			
R. Palmer	do do Baker	377 03			
T. Hughes	do do Carpenter	525 00			
J. Anthony	do do do	525 00			
J. Marvyn	do do Bricklayer and Mason	550 00			
P. Trowern	do do Engineer	740 00			
Sundry persons	Wages of attendants, farm hands, maids, and all other services	13,301 71			
			24,410 74		
Adamson, W., & Co.	Groceries	272 65			
Bruce, Robert	Painting	85 75			
Baines, E., & Co	Paints and oils	182 45			
Burns, P	Fuel	634 78			
Bulmer, Mrs. M	Brick	22 50			
Brown Bros	Stationery	117 20			
Barber Bros	Woollen goods	210 50			
Bryce, McMurrich & Co	Tweed, towelling, etc	716 29			
Bowery, George	Painting	12 25			
Collector, Customs	Duties	150 00			
Clark, D., M.D.	Sundry payments, travelling expenses	261 09			
Consumers' Gas Co.	Gas	2,021 04			
C. P. Industries	Clothing	6 30			
Caston, F. A., & Co.	Shoe goods	44 08			
Craig, A	Blacksmithing	181 74			
Cohn, L.	Stationery	10 00			
Cosgrave & Sons	Malt and hops	39 25			
Claxton, Thomas	Music	10 00			
Clark, J. & A	Oats and bran	58 94			
Central Prison	Hay	50 00			
Copp, Clark & Co.	Printing	12 50			
Covernton, T. S., Dr	Travelling expenses	3 89			
Dorrien Plating Co.	Repairing bells	1 80			
Dixon, John	Repairing carriages	53 35			
Doyle, M	Fish	630 00			
Dineen, W. & J.	Hats	22 86			
Express Co.	Charges	1 60			
Essery & Reid	Lumber	425 78			

Edgar, J. & Son	Crockery	64 70			
Eby, Blain & Co	Groceries	531 63			
Ernest & Jennings	Fruit	14 00			
Fisher, E. C.	Flour	8,894 74			
Fitch, J. C.	Tea	916 39			
G. W. Railway	Freight	6 19			
Graham, H. & Co.	Carpets	15 53			
Gurney, E. & C.	Repairing grates	5 50			
Gissing, A. W.	Eggs	2 80			
Guttapercha Rubber Co.	Rubber goods	27 00			
Hunt, D. J.	Roots	15 82			
Hughes Brothers	Clothing and carpets	1,563 58			
Hewitt, Wm. & Co.	Hardware	26 38			
Hodson & Boyd	Tweeds, etc.	543 63			
Hamilton, A.	Paints	166 18			
Knowlton, W. H.	Oatmeal, bran, and fuel	8,247 90			
Keith, D. S. & Co.	Plumbing	321 00			
Langton, Peter	Plants	2 50			
Lochart, A.	Flour	286 00			
London & Paris House	Cleaning and repairing clocks	8 00			
Lillie, Thos.	Plants	8 10			
Might & Taylor	Directories	5 00			
Morison, John	Groceries	2,401 42			
Mallon, John	Meat	538 98			
Miller & Co., Hugh	Drugs and Paint	1,018 52			
Morse, & Co., G. D.	Soap	479 88			
Manger, W. R.	Gold fish	5 00			
Michie & Co., G.	Groceries	2,105 80			
McGill & Co.	Fuel	706 59			
Macdonell, B.	Cow	40 00			
McLean, D.	Shoe finding	16 80			
McMillan, Jno.	Fruit	21 25			
McMaster, A. R. & Bro.	Cotton, etc.	402 06			
Neill, J. & Sons	Castings	205 30			
Nelson & Son, H. A.	Brooms	131 79			
Nolan, M.	Interments	28 00			
Notman, J.	Stationery	107 05			
Northern Railway	Freight	88 00			
Potter, Chas.	Spectacles and repairing bells	11 65			
Paterson, P. & Son	Hardware	1,147 83			
Park, Jas.	Butter, eggs, etc.	1,097 23			
Parsons, Jno.	Butter and eggs	3,713 99			
Petley, & Co.	Furnishings and dry goods	444 63			
Piddington, A.	Books	38 23			
Provincial Reformatory	Furniture	73 20			
Rouk, Jas.	Evergreens	3 00			
Rogers, F.	Meat	9,958 14			
Robinson, C. B.	Printing	226 30			
Rennie, Wm.	Seeds	42 31			
	Carried forward	52,964 11	24,410 74	.....	1,055,493 28

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	52,964 11	24,410 74		1,055,493 28
	ASYLUM FOR THE INSANE, TORONTO.—*Continued.*				
Rice, W. H.	Wire cloth	24 72			
R. C. Epis. Corp. Toronto	Cab hire	37 50			
Sundry newspapers	Subscriptions and advertisments	295 10			
Singer Man. Co.	Sewing machines and repairing	54 32			
Smith & Willy	Hair cloth	45 49			
Sewell, Robt.	Grates and ranges	11 85			
Sundry persons	Services in band	30 00			
Smith, A.	Blacksmithing, etc	44 62			
Smith, W. J.	Coffee	249 00			
Sundry persons	Manure	87 00			
Smith, Dr. A.	Veterinary services	24 00			
Sanborn, F. B.	Books	10 00			
Stuart, J. C. & Co.	Paper-hanging	32 15			
Smith & Keighley	Groceries	1,197 21			
Tracy, T. J.	Sundry payments	133 26			
Toronto Brewing Co.	Beer	162 50			
Toronto Lime Co.	Lime	34 20			
Taylor, W.	Groceries	195 24			
Turner & Leaman	Interments	45 00			
Thomson, W. & Co.	Nails	54 75			
Toronto Telephone Co.	Rent of box	7 00			
Underwood, A. L. & Co.	Lumber	476 18			
Watson, Charles	Apples	138 50			
Way, John	Repairing furniture	7 50			
Wheeler & Bain	Hardware, etc	327 28			
Willing & Williamson	Books	77 52			
Water-works	Water	2,000 00			
Wilson C. & Sons	Repairing scales	9 50			
Wallis, G.	Repairing tinware	9 15			
Warwick & Son	Binding	26 68			
Wilkes, Robert	Furnishings	14 42			
Wharin, W.	Repairing clock	1 00			
			58,826 75		
				83,237 49	

ASYLUM FOR THE INSANE, LONDON.

R. M. Bucke, M.D	Twelve months' salary as	Medical Superintendent	2,000 00		
T. J. W. Burgess, M.D.	do	Assistant do	1,000 00		
N. H. Beemer, M.D	do	First Assistant Surgeon	800 00		
T. Millman, M.D	do	Second do	600 00		
T. Short	do	Bursar	1,400 00		
R. Hardy	do	Storekeeper	800 00		
M. A. Pope	do	Matron	500 01		
S. Cope	do	Engineer	740 00		
G. Ross	do	Assistant Engineer	400 00		
J. A. Stewart	do	Carpenter	550 00		
A. Chapman	Two do	do	83 34		
J. McIntosh	Ten do	do	416 66		
J. Hardy	Twelve do	Bricklayer and Mason	550 00		
C. A. Passmore	do	Painter	300 00		
E. Penny	do	Gardener	400 00		
P. F. Canniff	do	Farmer	401 00		
Sundry persons	Wages of attendants, farm hands, etc		17,561 64		
				28,502 65	
Adee, Fred	Brass bibbs and piping		32 88		
Alley, H. B	Caps		2 72		
Anderson, J. J. & Co	Stationery		29 95		
Alldis, James	Repairing furniture		169 50		
Adams, A. H	Coffee		375 19		
Bucke, R. M	Travelling expenses, express, etc		153 78		
Boyd, Watson & Co	Brushes		100 48		
Broton, John	Strawberries		31 16		
Brock Thomas	Fish		650 75		
Bryce, William	Stationery and books		190 87		
Bailey, William	Fuel		743 70		
Broadbent, N	Sashes		9 95		
Blind Institute	Socks, clothing, baskets, etc		358 17		
Bryan, Thomas	Brushes		187 96		
Bown, E	Wood, poultry, etc		185 73		
Brnce, J. A. & Co	Seeds, etc		87 25		
Baines, E. & Co	Paints		445 68		
Bowers, J. W.	Charcoal		13 75		
Beattie & Co	Dry goods		1 99		
Bailey & Stinchcomb	Blacksmithing		101 37		
Bowman & Co	Sewer pipes		24 00		
Bell Telephone Co	Rent of box		12 50		
Buck, Wm	Furnishings		15 60		
Campbell, J	Repairs vehicles		160 50		
Chapman, Wm	Meat		4 70		
Coombs, Henry	Flour		238 10		
Chappell, Wm	Flour, butter, etc		10,327 00		
Cameron, J. & Co	Advertising, stationery and printing		400 00		
Catholic Record	Advertising		9 50		
	Carried forward		15,064 73	28,502 65	84,237 49

PUBLIC INSTITUTIONS MAINTENANCE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	15,064 73	28,502 65	83,237 49	1,055,493 28
	ASYLUM FOR THE INSANE, LONDON. *Continued.*				
Cameron, A. D.	Cement, lime, brick etc.,	227 99			
City Gas Co.	Gas	1,415 50			
Cole, A.	Repairs to furniture	3 60			
Cowan, James	Hardware	290 36			
Chapman, A	Allowance tools destroyed	7 18			
Cairncross, George	Seeds	1 00			
Clure, Robert	Straw	3 50			
Carty, R.	Oats	45 75			
Central Prison Industries	Boots and shoes, etc	377 67			
Canadian Agricultural Emporium	Seeds	219 66			
Collins, H	Potatoes	9 60			
Craig, S. H	Lumber	68 07			
Chapman, Charles	Binding	18 90			
Campbell, John	Repairs, carriage cushions, etc	77 25			
Cliperton, J.	Oats	25 20			
Dominion Telegraph Co.	Telegrams	34 48			
Dennis, R.	Blacksmithing	85 38			
Davis, Wm	Straw	11 34			
D. and D. Institute	Shoe material, shoes	783 08			
Divine, E.	Advertisement	5 00			
Express Co.	Charges	7 15			
Elliott Bros.	Groceries	5,032 71			
Evans, John	Oatmeal, oats, etc	924 55			
Fitzsimmons, T. H.	Apples	10 40			
Fitzmaurice, R. A.	Flower-pots and stands	20 58			
Fallon, Patrick	Ice and gravel	51 50			
Fitzgerald, F. A. & Co.	Lumber	48 00			
Flynn, Wm.	Rent allowance	6 00			
Fessenden Bros.	Needles	2 10			
Fisher, S.	Potatoes	17 67			
Fixter, Thomas	do	4 13			
Grand Trunk Railway	Freight	20 35			
Great Western Railway	do	24 96			
Guest, G. B.	Repairing harness, etc	169 05			
Gilbert, John	Straw	15 03			

Green, H. C.	Lumber	885 80		
Gilmour, John	Fuel	171 19		
Green, J. & Co	Dry goods, etc.	3,490 94		
Hyman, C. S. & Co	Shoes	94 10		
Hunt Bros	Coal	6,403 59		
Holland, Thomas	Tolls	49 53		
Hinton, Wm.	Interments	212 00		
Hardy, A. D.	Services	178 06		
Hobbs, Osborn & Hobbs	Glass	10 75		
Hardy, Mrs	Expenses re removal	10 00		
Hardy, Aquila	Wooden bowls	1 90		
Hiscott, W. E.	Services of band	27 00		
Happy Hours Co.	Amusements—music	6 95		
Haskett, J. & H.	Painting	10 00		
Heck, John	Straw	14 91		
Harkness & Co.	Medicines—chemicals	214 33		
Hobbs, John	Potatoes	21 39		
Horner & Somerville	Poultry, biscuits, &c.	3 75		
Imperial Oil Co	Oil	28 72		
Joliffe, L. G	Gas globes, etc	12 50		
Kaoka Co	Kaoka	180 30		
Kerr, D	White lead	8 30		
Logan, James	Silver polish	2 75		
Loughrey & Tackaberry	Letter-bag, etc	15 50		
Lacey, M. J.	Blacksmithing	12 65		
Laing, J. B. & Co	Canvas, combs, clothing, etc.	4,295 51		
Lyon, J	Pens	6 00		
London Street Railway Co.	Hire of vehicles	60 00		
Lewis, Robert	Paints and oils	277 37		
Lea, Henry	Fruit	30 37		
London Steam Supply and Manufacturing Co	Castings	17 40		
Murray, R. S. & Co	Rugs, mats, etc	276 39		
Micheltree, Joseph	Meat	10,124 38		
Masurett, M. & Co	Groceries	3,082 92		
Mountjoy, R.	Fruit, etc	126 09		
Miller, John	Stove and furnishings	251 79		
Murray, A. S. & Co	Clocks	21 25		
Meek, E. Mrs	Gatekeeper	35 00		
McDowell, George	Butter, fruit and flour	4,189 12		
McCormack Manufacturing Co	Biscuits	163 02		
McKenzie, S. H.	Wood	173 40		
McClary Manufacturing Co.	Castings	13 48		
McCracken, H.	Potatoes	15 34		
McFee, Lind & Co.	Hats and gloves	584 50		
McClary, J.	Straw	23 73		
McCallum, C	Paints and oils	14 10		
McClineghan, D.	Carpet	75 60		
	Carried forward	61,553 09	28,502 65	83,237 49	1,055,493 28

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	61,553 09	28,562 65	83,237 19	1,055,493 28
	ASYLUM FOR THE INSANE, LONDON. *Continued.*				
McCall, Wm	Straw	5 00			
McCallum, C	Paints, oils, etc.	78 45			
North Branch Cheese Fact'ry	Cheese	21 00			
Nelson, H. A. & Son	Brooms	223 43			
Northcott, W	Potatoes	16 10			
Nordheimer, A. & S	Musical furnishings	16 95			
Notman, J	Stationery	10 15			
O'Meara, M	Cab hire	115 50			
O'Brien, P	Potatoes	143 67			
Oliver, John	Indellible tablets	9 00			
Plummer & Son	Wheelbarrows	40 30			
Proctor, E. M	Registrar's fees	2 06			
Parsons, J	Eggs	23 10			
Passmore, Mrs. S. A	Expenses removal to London	25 00			
Passmore, C. A	Advertising	10 00			
Peel, T	Cutting clothing	61 55			
Polk, R. L. & Co	Directory	3 00			
Powell, A. B. & Co	Oil cloth	2 50			
Rudd, C. B. & Tennant	Veterinary services	74 15			
Reid, James & Co	Hardware furnishings	1,105 16			
Rowlands, Fred	Bacon, hams, etc.	1,047 92			
Regan, D	Shoes	15 32			
Robinson, W. H	Medicines	214 00			
Robinson, Little & Co	Dry goods, etc.	1,622 15			
Reid, W. J. & Co	Furnishings, glassware, etc	775 80			
Robinson, C. B	Printing	7 65			
Rogers & King	Baths	22 00			
Reed Bros. & Co	Stationery and binding	18 25			
Riddle, G.	Repairs to slate roof	25 00			
Saunby, J. D.	Bran	36 61			
Southam & Brierly	Invitation cards	7 00			
Seatchard, E	Wood	550 49			
Shuff, G. & Co	Lard	31 78			
Scott, H. H	Exchange on cultivators	20 00			
Sundry newspapers	Subscriptions and advertising	95 64			
Stewart, S	Furnishings, tinware, etc.	80 51			

Saunders, William	Chemicals, etc.		357 81			
Stockwell, C. & W.	Dying damask		5 75			
Slater, A.	Potatoes		29 51			
Slater, J.	do		11 60			
Stinchcomb, William	Repairing implements		37 19			
Scanlan, John	Tolls		2 70			
Short, Thomas	Postages and stabling		368 99			
Smyth, J. B.	Poultry		228 90			
Seale & Childs	Woodenware		15 00			
Strong, W. T.	Drugs, etc		303 38			
Sundry persons	Services in band		84 00			
do	Expenses, recovering patients		27 50			
Stephens, Turner & Burns	Plumbing, force pump		165 05			
Smith, William	Repairing machine		5 30			
Stephenson, S.	Straw		72 03			
Sumner, L.	Threshing		45 00			
Stewart & Co.	Agricultural implements		13 35			
Smith, James	Woodenware		27 00			
Sanborn, F. B.	Books		10 00			
Stevely, William	Stovepipe, etc		134 44			
Shaw J.	Poultry		18 00			
Thompson, Samuel	Tolls		4 00			
Tackaberry, R.	Straw		58 20			
Taylor, E. A. & Co.	Books and music		44 50			
Titler & Rose	Tea		1,128 08			
Wood, J. F. & Co.	Cracked wheat		10 00			
Whitter, W.	Seed potatoes		7 50			
Walker, William	Bricks		67 50			
Waterman Bros.	Oil		35 29			
Wilson, W. & J.	Soap		526 87			
Wright, J. A.	Blacksmithing		15 75			
Wallace, John	Travelling expenses		7 40			
Whetter, F.	Poultry		185 76			
Zeiss, W. & Co.	Paints		20 00			
				71,682 93		
					100,185 58	

ASYLUM FOR THE INSANE, KINGSTON.

W. G. Metcalf, M.D.	Twelve months' salary as	Medical Superintendent	1,599 98			
J. W. Montgomery, M.D.	do	Assistant do	999 98			
W. Anglin	do	Bursar	1,200 00			
A. McLean	do	Steward	500 00			
J. McManus	do	Store-keeper	500 00			
M. B. Aitkin	do	Matron	500 00			
S. E. Hardy	One do	Assistant Matron	16 66			
A. R. Milne	Twelve do	Engineer	699 98			
D. Donnelly	do	Assistant Engineer	399 98			
S. Kirk	do	Stoker	300 00			
J. Little	do	Carpenter	450 00			
	Carried forward		7,166 58		183,423 07	1,055,493 28

PUBLIC INSTITUTIONS MAINTENANCE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	7,166 58		183,423 07	1,055,493 28
	ASYLUM FOR THE INSANE, KINGSTON.—*Continued.*				
H. Scott	Twelve months' salary as Baker	399 98			
H. Kerr	do Cook	360 00			
J. Redmond	do Gardiner and Farmer	399 97			
Sundry persons	Wages of attendants, farm hands, maids, and other servants	9,019 40			
			17,345 93		
Anglin, Wm	Sundry payments	130 61			
Asseltine, Wm.	Straw	11 25			
Ashley, C.	Hay	10 28			
American Rubber Co.	Rubber goods	87 48			
Anglin, W. B. & S.	Lumber and Manure	367 49			
Anglin, Thos	Potatoes	4 34			
Automatic Pen Co.	Pens	1 60			
Bennington, Geo.	Straw	12 32			
Burk, J. B	Disinfectants	6 00			
Beaton, W.	Hay	5 83			
Bell Telephone Co	Rent of Telephone	10 60			
Baines, E., & Co.	Paint	183 41			
Bryant, John	Ploughing and Teaming	11 00			
Burk, M.	Potatoes	14 28			
Black, P	Potatoes	1 43			
Boyd, James	Plums	3 50			
Brame, H	Interments	20 75			
Collector of Customs	Duties, etc.	142 43			
Carson, Robert	Flour	5,417 69			
Chown S., & Son	Paints, oils, etc	11 27			
Cornell, F. J	Vegetables	5 00			
Compton, W. H	Milk	122 96			
Chown & Cunningham	Stove castings	26 50			
Crawford, R., & Co.	Wood	386 00			
Chown, W. W	Plough, etc	10 10			
Cataraqui Cemetery Co	Interments	36 00			
Delaney, James	Interments	24 00			
Dominion Telegraph Co	Telegraphs	13 69			
Davidson, Doran & Co.	Repairing Boiler, etc.	176 04			
Dupe, W	Potatoes	5 15			
Delaney, P	do	2 28			

Doran, D	do	2 66			
Drennan, S. T	Furniture	52 50			
Darling, C. A	Potatoes	12 10			
Dodds, R	Boiler	12 50			
Doherty, P	Blacksmithing	38 85			
Express Co	Charges	5 75			
Ewing Bros	Seeds and plants	24 65			
Elliott, J	Flower pots	31 55			
Ferris, B. A	Milk	115 50			
Foley, M	Cartage	2 00			
Fraser & Mowat	Hardware	792 72			
Folger & Hanley	Freight	2 00			
Follest, W. B	Cleaning chimneys	2 00			
Fraser, C	Potatoes	2 22			
Farell, M	do	6 57			
Fenwick & Hendry	Soap	155 03			
Grand Trunk Railway	Charges	18 35			
Gowdey, James	Meat	7,099 04			
Gibson, J. F	Hay, straw, etc	27 29			
Gage Bros	Repairing clocks, and clock	17 00			
Grahame, George	Plastering	70 88			
Gibson, R	Potatoes	19 39			
Gilbeard, G	do	2 10			
Gleison, J	Ice	10 00			
Grant, A. C	Scenery	16 00			
Haycock, F	Poultry	16 97			
Henderson, J. & Co.	Books, stationery, and postage	112 69			
Hughes & Hewton	Cracking peas	2 40			
Horsey, R. M	Furnishing Fire Extinguishers	113 05			
Hutchinson, J. E	Flour, mattrass, and toilet set	16 05			
Haycock, J. L	Eggs	26 00			
Herstein, A. L	Surgical instruments	7 50			
Hammer, John	Adjusting scales	12 50			
Hacket, J	Woollen yarn	79 20			
Jackson, Mrs	Potatoes	1 41			
Kelley, McKay & Daunt	Malt	20 00			
Kingston Gas Light Co.	Coal	22 50			
Kingston Street Railway	Use of vehicles	12 00			
Kennedy, J	Potatoes	1 58			
Kaoka Co	Kaoka	30 00			
Kavanagh, John	Bran	30 00			
Langwith, James	Oats	16 62			
Lucas, Joseph	Hops	5 60			
Lawson, George	Straw	13 50			
Lyons, L	Spectacles	5 40			
Lowden, Neil & Co.	Chemicals	19 75			
Murphy, R.	Potatoes	1 60			
Moore, D	do	15 27			
Metcalf, W. G., M.D.	Travelling expenses, etc	87 45			
	Carried forward	16,464 87	17,345 93	183,423 07	1,055,493 28

PUBLIC INSTITUTIONS MAINTENANCE. *Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	16,161 87	17,345 93	183,423 07	1,055,493 28
	ASYLUM FOR THE INSANE, KINGSTON. *Continued.*				
Militia Department	Rent of Land	6 80			
Mills, Thomas	Straw	4 00			
Murray, D. H	Plants	1 50			
Makin, Mary	Potatoes	1 43			
Martin, W. J	do	1 60			
Mills, J	Subscription to Central Fair	2 00			
Metcalf, J. H	Clock	20 00			
Millar, James	Potatoes	116 94			
McCormack, John	Straw	61 07			
McIntosh,—	Veterinary services	7 25			
McConville, B	Cartage	11 00			
McColl & Hiscock	Apples and fruit	33 56			
McRae, W. R., & Co	Groceries	2,078 67			
McNee & Minnes	Furnishings and dry goods	3,331 43			
McKay, Jno., jr	Shoes and leather	322 18			
McCannon, J	Lime	6 90			
McLean, A	Potatoes	107 79			
Maguire, V	Trees	5 00			
Maguire, James	Cows	54 00			
McAuley,	Stationery, binding, etc	175 30			
McKelvey & Bride	Castings	104 31			
McMaster, E	Potatoes	2 49			
McConnell, J	Potatoes and oats	15 53			
Notman, J	Stationery	22 40			
Nelson, H. A., & Son	Brooms	97 47			
Nordheimer, A. & S	Musical instruments	25 60			
Nicholson, Thomas	Carpentering	20 00			
Nichol, J. L	Trees	6 30			
Napanee Brush Co	Brushes	54 00			
Oliver, F	'Bus hire	2 00			
Ottoman Calvey Co	Coffee	381 10			
Portsmouth, Corporation of	Sidewalk	86 25			
Pense, E. J. B	Advertising	137 14			
Postmaster	Rent of Box	4 50			
Purdy, A	Hay and straw	11 37			
Parker & Evans	Repairing boiler, compound, etc	77 01			

Parrott, Wm	Straw	3 80			
Peters, S	Straw	7 50			
Ryan, J. B	Tailors' square	2 10			
Rose, R. M	Examining title *re* will, George Fisher	1 90			
Reid, M. S	Potatoes	32 29			
Rice, David	Potatoes	4 05			
Redden, James	Groceries	5,122 34			
Robinson, G. W	Repairing sleighs	124 05			
Rigney, T	Manure	15 00			
Redden, G	Hay	6 51			
Redden, J	Hay	6 07			
Rees Bros	Peaches	11 60			
Richardson, W. L	Frame	2 95			
Redman, P	Cow	50 00			
Richmond & Boyden	Furniture and carpeting	183 84			
Robertson Bros	Crockery and glassware	256 10			
Ray, T. B	Harness	125 48			
Root, Charles	Oats	16 00			
Richardson, J., & Son	Corn	39 17			
Robinson, C. B	Printing	6 35			
Reid, John	Hay	11 55			
Sundry persons	Recovering patients	35 10			
Scott, Thomas	Groceries	30 10			
Sundry newspapers	Subscriptions, etc	125 25			
Schroder, James	Smoking hams	2 90			
Skinner, H	Paints, oils, etc	214 60			
Spencer, L. B	Locksmithing	12 00			
Stooms, John	Straw	8 27			
Smith, S	Seed oats	10 32			
Stacy & Walpole	Postage stamps and books	23 80			
Sanborn, F. B	Books	7 00			
Sharp, Capt	Manure	15 00			
Smith, W	Straw	9 15			
Shepard & Dudley	Surgical instruments	23 25			
Swift, James	Coal	6,837 19			
Tagart, John	Potatoes	4 05			
Welborn, W	Manure	99 60			
Wade, H	Medicines	327 10			
Wilson, Capt.	Manure	8 75			
Woods, S	Account books	6 30			
Wilson, John, & Co.	Peas	34 42			
Wright, John	Teaming, etc	14 55			
Wilson & Davis	Cab and van hire	7 00			
Warwick & Son	Binding	2 00			
Warden, Penitentiary	Stone and gravel	11 75			
Yatman, James	Potatoes	8 00			
Yates, A	Stage scenery	100 00			
			37,849 86		
				55,195 79	
	Carried forward			238,618 86	1,055,493 28

PUBLIC INSTITUTIONS MAINTENANCE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward			238,618 86	1,055,193 28
	ASYLUM FOR THE INSANE, HAMILTON.				
J. M. Wallace, M.D	Eleven months salary as Medical Superintendent	1,466 63			
T. S. Covernton, M.D	Nine do Assistant do	599 94			
C. K. Clarke, M.D	Two do do do	133 32			
B. Way	Eleven do Bursar	733 26			
J. Shaw	do do Storekeeper and Steward	550 00			
J. Marter	do do Engineer	550 00			
T. Morley	Four do Assistant do	80 00			
W. Mosier	Five do do	100 00			
W. Lydiat	Two do do	33 55			
J. Rose	Four do Stoker	80 00			
H. Seaman	Seven do do	140 00			
C. Reece	Eleven do Carpenter	458 26			
A. Goodall	do do Farmer and Gatekeeper	412 50			
Mrs. C. Fitzgerald	do do Matron	366 63			
Sundry persons	Wages of attendants, farm hands, maids and other servants	6,134 96			
			11,839 05		
Andrews, J. B	Hay	20 61			
Aitchison & Co	Lumber	9 25			
Becket, Thos	Straw and hay	61 70			
Bruce, J. A., & Co	Seeds and lime	57 25			
Brierly, R	Chemicals and medicines	66 08			
Burrows, Stewart & Milne	Fire pots	2 08			
Brown, A. J	Plastering	144 95			
Brigham, Wm	Oats	25 70			
Bernard, H	Wood	22 00			
Buntin, Gillies & Co	Paper and ink	8 25			
Barnes & Co	Paints	6 73			
Becket, H	Stock	5 25			
Chilman, J. C	Bread, etc.	825 28			
Cooper & Co., H. G	Blacksmithing	186 81			
Collector of Customs	Customs dues	45 99			
Canada Whip Co	Whips	6 75			
Campbell, R	Fire brick and pans	6 00			
Central Prison Industries	Boots and slippers	374 60			
City of Hamilton	Interments	34 50			
John Cowey	Cow	30 00			

Callon, Wm.	Hay	8 95			
Canada Glass House	Glassware	2 70			
Clarke, Dr.	Expenses of removal	4 66			
Duncan, A. & Co.	Clothing	3,498 29			
Dickenson, J.	Hay and apples	88 39			
Dayfoot, J. B.	Lumber	102 01			
Donelley, A.	Freight and cartage	8 36			
Dominion Telegraph Co.	Telegraphing	6 15			
Duncan, R. & Co.	Envelopes	3 00			
Dickson Bros.	Apples	1 00			
Dryen, Wm.	do	16 55			
Douglass, H.	Wood	30 80			
Eastwood & Co.	Stationery	241 48			
East, H.	Repairing furnaces	37 12			
Field & Davidson	Clothing	13 00			
Fisher, E. C.	Flour	3,162 50			
Farmer, Wm.	Repairing machinery	34 10			
Forster, A. M.	Repairing tinware, etc.	8 75			
Griffith, S.	Freight and cartage	5 52			
Grant, P. & Sons	Malt	2 00			
Hamilton, A. & Co.	Medicine	17 80			
Hutchison, N.	Tailoring and clothing	86 22			
Hemphill, Z.	Tuning pianos	4 50			
Hennesy, H.	Blacksmithing	64 42			
Hendry & Co.	Cartage and freight	3 52			
Hamilton Water-works	Water	510 62			
Hamilton Gas Co.	Gas	1,673 89			
Howard, James.	Plastering	2 00			
Harriett, H.	Straw	10 56			
Howles, James	Tinware, etc.	58 65			
Hutton, G. S.	Music	2 00			
Henry, Wm.	Hay	7 31			
Hart & Rawlinson	Day-book	24 00			
Irwin, W. H.	Directory	2 50			
Jackson, Thomas	Oats	28 40			
Kerr, A. R. & Co.	Clothing	27 13			
Keith, D. S. & Co.	Plumbing	9 00			
Kelley, R.	Hay	7 65			
Kelley, A.	Oats	21 22			
Lewis & Co.	Lumber	120 91			
Lumsden & Bro.	Tea, apples and fruit	193 63			
Lovett, William	Hay	28 28			
Lees, Thomas	Spectacles and clock	3 98			
Muirhead, Wm.	Meat	5,060 10			
Meakins, E.	Music	32 00			
Montreal Telegraph Co.	Telegrams	6 98			
Muirhead, R. B.	Straw	20 22			
Murton & Reid	Lumber	125 00			
Magee, W.	Ice	280 00			
	Carried forward	17,656 63	11,839 05	238,618 86	1,055,493 28

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	17,656 63	11,839 05	238,618 86	1,055,493 28
	ASYLUM FOR THE INSANE, HAMILTON.—*Continued.*				
Myles, Thomas	Coal	56 42			
Morse & Co	Soap	10 88			
Morgan Bros	Hops and malt	4 40			
Maude, John	Straw	7 00			
Moore, D. & Co	Measures	1 00			
Maclem, Thomas	Straw	10 36			
Morrison, James	Repairing steam gauge	4 00			
McDowell, G	Butter	53 55			
McKay, S	Stabling	46 30			
McPhie & Farmer	Plumbing	19 10			
McIlwraith, Thomas	Coal	5,603 93			
McLaren & James	Cheese	83 30			
McAlister, Joseph	Wood	27 31			
McPhie, O	Plumbing	2 33			
Nelson, H. A. & Sons	Brooms	45 86			
North, C. W	Repairing	29 10			
Notman, J	Stationery	5 00			
Osborne, James	Groceries and fruit	1,223 50			
Ottoman Cahvey Co	Coffee	143 12			
Oliver, J	Marking ink	12 00			
Parsons, John	Butter	1,654 52			
Postmaster	Rent of box	4 00			
Philp, James	Repairing harness	15 35			
Pray, R	Interments	164 00			
Pickard, J. S	Straw	9 82			
Philp, James	Repairing harness	1 00			
Palmer, R. H	Brushes	15 00			
Rymal, C. E	Straw	15 37			
Rosseaux, Woolson & Co	Groceries	465 03			
Running, B	Oats	18 42			
Richards, S. P	Coffee	39 14			
Sutherland, A	Groceries	609 77			
Stewart & Macpherson	do	3,788 51			
Sundry newspapers	Subscriptions and advertisements	141 76			
Skinner, J. A. & Co	Glassware, etc	352 37			
Somerville, James	Printing	49 63			

Shaw, John	Travelling expenses	4 51		
Smith, M. F.	Straw	10 06		
Smith, A	Harness	44 00		
Sweeney, James	Repairs to pipes	13 00		
Sagar, William	Hay	12 76		
Smith, G. F.	Oats	32 35		
Shaver, J. G.	Straw	9 38		
Spectator Printing Co.	Printing	3 00		
Smith, T.	Potatoes	6 71		
Springer, Dr.	Travelling expenses	14 90		
Springstead, G.	Oats	31 74		
Sanborn, F. B	Books	7 00		
Times Printing Co	Printing	8 75		
Tuch, Adam	Straw	8 19		
Telephone Company	Rent of box	25 00		
Toronto, L. A	Envelopes	8 34		
Vannear, E.	do	4 50		
Wric, William	Straw	6 16		
Wood & Leggat	Hardware	812 95		
Way, Bidwell	Sundry payments	67 12		
Wilson, A. & Co.	Medicines, drugs, etc	261 59		
Walker, James	Soap	267 30		
Williams, J. M. & Co.	Tin and woodenware	20 88		
Walls, James	Blacksmithing	39 67		
Woods Walter	Washboards	1 50		
Wallace, J. M.	Travelling expenses	4 70		
Young Hugh	Fish, poultry, etc	11 95		
Young & Bro.	Fibre washers	11 16		
			34,143 95	
				45,983 00

ASYLUM FOR THE INSANE, ORILLIA.

A. H. Beaton, M.D	Twelve months' salary as Medical Superintendent	1,599 63		
A. Kennedy	do Bursar	1,100 00		
M. Elliott	Six and one-half do Matron	150 00		
E. Kirkpatrick	Eight and one-half do do	212 50		
J. Patterson	Twelve months' salary as Engineer	600 00		
H. McLean	do Assistant Engineer	339 96		
J. B. Ellis	do Gardener	375 00		
Sundry persons	Wages of attendants, farm hands, maids, and other servants	3,709 29		
			8,086 42	
Bertram, P., & Co	Hardware	287 33		
Bryce, McMurrich & Co.	Towelling	345 39		
Baker & O'Hara	Music	5 00		
Bond, Mrs	Fish, fruit, etc	5 34		
Buckley, C.	Ice	10 00		
Bingham, W. G	Hardware	48 22		
Baker, A	Straw	3 00		
Bains, E., & Co.	Paints and oils	37 18		
	Carried forward	741 46	8,086 42	284,601 86	1,055,493 28

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	741 46	8,086 42	284,601 86	1,055,493 28
	ASYLUM FOR THE INSANE, ORILLIA. *—Continued.*				
Bloomfield, James	Hay	4 56			
Beaton, A. H., M.D	Travelling expenses	51 00			
Bushell, E	Hay	9 15			
Blind Institute	Socks, baskets, etc	86 00			
Consumers' Gas Co	Coke	69 50			
Crowe, M	Hay	66 89			
Coffey, T	Wood, etc	250 22			
Cooke, H., & Co	Drugs, etc	49 83			
Crak, J. & A	Groceries	18 50			
Chisamore, Mrs. H	Apples	9 00			
Cosgrove, J. J	Inspecting scales	3 20			
Connelly, Mrs P	Fruit	7 65			
Crockford, A	Hay	7 32			
Calverley, W	Stock	4 00			
Dunlop, A	Straw and apples	23 38			
Drinkwater, T. & S	Straw	8 00			
Dressider, M. A	Sewing	12 60			
Dominion Telegraph Co	Telegrams	4 01			
Dunlop, R	Straw and oats	36 01			
Duncan, R	Hay	10 68			
Fitch, J. C	Groceries	347 90			
Fitzgerald, P	Repairing shoes	1 30			
Garvy, Sarah	Socks	37 50			
Gilchrist, F	Repairing buildings	126 15			
Gill, B	Pump	7 00			
Gribbon, F. G	Fish	3 50			
Gunn, D., & Co	Hams	8 58			
Gilmour, N	Vegetables	14 75			
Goffat, T	Postage	7 03			
Hind, J. J	Crockery	57 69			
Harvie, J. R	Wood	235 00			
Harvie, J. C	Wood	62 50			
Hatley, J. J	Poultry and groceries	65 47			
Hurd, J. J	Crockery	7 70			
Harnden, J. P	Express and crates	5 20			
Hunter, Rose & Co	Printing	15 50			

Harvie, W. R.	Straw, etc	13 50			
Herson, Jas.	Fruit	4 00			
Herring, E. P.	Eggs	4 24			
Irish, N. B.	Potatoes	122 79			
Imperial Oil Co.	Oil	6 48			
James, R. A.	Fruit	18 00			
Joice, Wm.	Straw	3 00			
Kennedy, A.	Sundry payments	16 61			
Kean, Frank	Groceries	23 50			
Kaoka Co.	Kaoka	9 00			
Lawrence, H. H.	Veterinary Services	7 00			
Lougheed, W.	Cartage	6 00			
Loyd, D.	Copy of Will	91			
Laidlaw & Nicol	Fruit	6 60			
McNeil, J.	Vegetables	19 95			
McNivin, Jno.	Potatoes	73 50			
McKerroll, D.	Fish, etc.	3 00			
McLeod, Jas.	Blacksmithing	3 05			
McLean, A.	Live stock	3 00			
McGuire, W. J., & Co.	Argand burner and plumbing	10 57			
McLeod, W. R.	Printing	22 50			
McGeough, J. E.	Repairing harness	1 50			
McGeough, D. H.	Repairing harness	1 45			
Mulcahey, T.	Sugar	58 30			
Moe, H.	Freight	99 63			
Morse & Co., G. D.	Soap	228 00			
Murray and Beaton	Printing	12 50			
Mitchell, T. B.	Interments, etc.	72 95			
Morton, Thos.	White-washing	11 25			
Murray, John	Ploughing	6 00			
Mainor, Robt.	Plumbing	15 95			
Madden, P.	Carpentering	1 90			
Murphy, John	Straw	26 86			
Michie & Co.	Groceries	71 07			
Mahoney, Jas.	Potatoes	24 00			
Moffatt, C. H.	Pasture	53 50			
Murray, P.	Printing	3 00			
Nelson & Sons	Brooms	33 80			
Newcombe & Co., O.	Tuning Pianos	3 00			
Overend, W.	Vegetables	6 20			
Ottoman, Cahvey Co.	Coffee	73 63			
O'Donnell, Jno.	Potatoes	33 10			
Passmore, J.	Meat	1,623 53			
Perry, John	Butter	379 19			
Pace & Main	Groceries	82 31			
Postmaster	Postage, rent of box, etc	39 77			
Phillips, T.	Repairing buckets	16 12			
Parker & Evans	Boiler compound	22 50			
Perry & Alport	Butter	656 74			
	Carried forward	6,540 68	8,086 42	284,601 86	1,055,493 28

PUBLIC INSTITUTIONS MAINTENANCE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	6,540 68	8,086 42	284,601 86	1,055,493 28
	ASYLUM FOR THE INSANE, ORILLIA.—*Continued.*				
Petley & Co	Carpets	44 15			
Patterson, Mrs. J	Rent of Superintendent's House	75 00			
Phillips, T	Repairing tinware	2 90			
Perry & Alport	Butter	85 85			
Quinn, James	Horse-hire, etc	112 50			
Ramsay, W., & Co	Groceries	617 92			
Rowe, B. H	Fuel	109 00			
Rowe, C. H	do	57 25			
Regan, M	Vegetables	16 93			
Rutherford, J	Live stock	17 55			
Robinson, O	Repairing sewing machine	2 00			
Robinson, J., Son & Co	Cloth	533 96			
Ramsay, W	Blacksmithing	24 38			
Ralston, A	Shoes	4 75			
Robins, R	Vegetables	11 47			
Robinson, T. H	Chemicals	17 39			
Sundry newspapers	Advertising and subscriptions	34 96			
Strathern, D	Hay and straw	81 09			
Sutton & Trill	Repairing pumps	52 32			
Sinclair, H. F	Fruit	4 55			
Sullivan, K	Services as nurse	2 00			
Simmers, J. A	Seeds and plants	10 63			
Slaven, J. W	Seeds and Chemicals	33 15			
Smith, J. J	Cartage	13 00			
Stone & Wellington	Trees, etc	10 00			
Stephenson, J. A	Fruit	1 00			
Smith, S	Repairing washing machine	0 40			
Sanborn, F. B	Books	5 00			
St. Germain, Mrs	Baskets	1 20			
Scadding, H. S	Vegetables	18 00			
Sullivan, John	do	6 30			
Tudhope, W. R	Stationery, etc	74 00			
Tite, George	Toys, painting, etc	18 70			
Taylor, Fred	Wood	200 00			
Taylor, E. A. & Co	Blank books	17 50			
Timlin, Martin	Straw	6 00			

Thompson, W.	Potatoes	7 68			
Tate, A	Lumber	19 55			
Tutten & Trill	Blacksmithing	3 22			
Vick, G	Bread, flour, etc	2,178 85			
Vantassell, G. W	Sewing machine, and repairing	56 50			
Williams, J. E	Fish	37 46			
Wright, C. P.	Fuel	105 00			
Willis, Robert	White-washing	10 31			
White, G. H. & Co.	Oil, shears, etc	14 09			
Wood, H.	Straw	8 25			
Zeine, Mrs. John	Potatoes	6 75			
			11,311 24	19,397 66	
	CENTRAL PRISON MAINTENANCE.				
W. S. Prince	Ten months' salary as Warden	1,666 62			
J. Massie	Two do do	333 32			
M. Logan	Twelve do Deputy Warden	1,299 96			
W. Featherstonhaugh	do Bursar	1,200 00			
W. T. Aikins, M.D	do Physician	999 96			
D. McCarthy	do Steward	750 00			
J. Clarkson	do Engineer	739 92			
Sundry persons	Wages of guards and other officers	9,939 60			
			16,929 38		
Blind Institute	Mitts and socks	290 44			
Burns, P.	Coal and wood	106 80			
Bryce, McMurrich & Co	Dry goods	273 99			
Brown Bros.	Books and stationery	56 20			
Blachly, W.	Eggs	5 25			
Brown Wm.	Repairing buggy	1 00			
Burns, John	Ice	74 56			
Baines, E.	Paints	4 36			
Beckett, E.	Grate bars	55 41			
Bond, R.	Stabling	2 00			
Berwick, J	Groceries	60 53			
Burns, C	Ice	7 50			
Blind Institute	Locks, etc	80 25			
Butwell, H.	Bricklaying	100 00			
Clarke, George	Cab hire	58 50			
Collector of Customs	Duties	26 41			
Consumers' Gas Co	Gas	647 13			
Cosgrave & Sons	Malt and Hops	54 25			
Cosgrove, Owen	Teaming, ploughing	173 75			
Central Prison Industries	Clothing, lumber, etc	3,237 88			
Currie, Neil	Fire clay	11 25			
Carnegie, C.	Repairing clocks	6 25			
Clarkson, J.	Allowance for coal	50 00			
Casey, Mrs. H.	Milk	10 77			
Doyle, M.	Fish	150 00			
	Carried forward	5,544 48	16,929 38	303,999 52	1,055,493 28

PUBLIC INSTITUTIONS MAINTENANCE. *Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	5,544 88	16,929 38	303,999 52	1,055,193 28
	CENTRAL PRISON MAINTENANCE.—*Continued.*				
District Telephone Co	Rent of instrument	6 00			
Dunn, J. R.	Straw and hay	189 08			
Doyle, P.	Prayer-books, etc	99 17			
Dixon, William	Repairing cushions	10 60			
Eby, J. F. & Co	Groceries	76 22			
Elliot & Co	Paints, etc	554 90			
Evans, G. & E.	Stovepipes	26 75			
Express Co.	Charges	3 65			
Eby, Blain & Co	Groceries	485 36			
Featherstonhaugh, William.	Sundry payments	195 72			
Fitch, J. C.	Groceries	1,063 46			
Fisken, John & Co.	Oil	17 50			
Foxwell, A.	Pasture	13 00			
Hall, F. & Son	Clothing	17 00			
Great Western Railway	Freight	11 32			
Gurney, E. & C. & Co.	Stove furnishings	22 99			
Gow, G. W.	Bricklaying	27 50			
Gallagher R. S.	Fruit	3 24			
Hall, T. & Son	Gloves	16 86			
Hughes Bros	Clothing	277 64			
Hunter, Rose & Co	Printing	4 00			
Hallam, John	Leather	72 33			
Hatch, Bros.	Tinware	10 50			
Imperial Oil Co.	Candles	64 80			
Jordon, Thomas	Cab hire	22 50			
Johnston, B.	Milk	27 30			
Johnston, J.	Apples	5 49			
Leslie, George & Son.	Trees	24 50			
Jacobi, P.	Thread, etc	9 25			
Knowlton, W. H.	Fuel, hay and oats	3,385 39			
King, R. S.	Coffee	1 40			
Lyons, N.	Spectacles	5 00			
Mercer Reformatory	Clothing	118 00			
Mallon, John & Co.	Meat	5,992 76			
Morse, G. D. & Co.	Soap	131 42			
Morison, John	Groceries	729 70			

Montreal Telegraph Co.	Telegrams	16 90			
Michie, George, & Co.	Groceries	83 25			
McMaster, A. R., & Bro	Thread	714 21			
McConvey, James	Cab-hire	119 00			
McGuire, W. J., & Co.	Castings and plumbing	39 05			
McCarthy, D	Allowance for rent	177 00			
McGill, William, & Co.	Fuel	148 20			
McEachern, N	Furnishings	26 15			
McLean, D	Shoe-findings	1 20			
Nelson, H. A., & Sons	Brooms, razors, etc	137 41			
Newton, C	Milk	159 54			
Notman, J	Stationery	86 95			
O'Connor, D	Caps	44 15			
O'Riley, E. B.	Sand	8 00			
Paterson, P., & Sons	Hardware	195 41			
Penny, E. C., & Co.	Meat	40 00			
Park, James	Provisions, etc.	12 47			
Potter, C.	Thermometers	4 00			
Ryan, Wm	Flour, etc	7,171 56			
Roberts, John	Locksmithing	14 40			
Robinson, C. B.	Printing	35 73			
Rice Lewis & Son	Hardware	2 59			
Rodgers, D.	Repairing lawn-mower	3 50			
Rawbone, J. L.	Cartridges	8 80			
Sundry newspapers	Advertisements and subscriptions	280 65			
Stothers, M. J	Teaming	26 25			
Smith, A., V.S.	Veterinary services	16 00			
Simmers, J. A	Seeds	33 90			
Somerville, J	Fruit	4 03			
Stinson, J	Apples	17 00			
Singer Manufacturing Co.	Sewing machine furnishings	1 60			
Sanborn, F. B.	Books	10 00			
St. Michael's Cathedral	Cab-hire	62 50			
Thorne & Co	Crockery	34 30			
Terry, E.	Fire-brick and clay	18 00			
Toronto Lime Co	Lime, fire-brick, etc	44 00			
Taylor, W	Fish	16 53			
Thomson, W. & Co.	Crockery	6 78			
Telephone Co.	Rent of instruments	24 60			
Toronto Prisoners' Aid Association	Cab-hire	112 50			
Union Oil Co.	Soap-stock	88 59			
Verral, George	Cab-hire	373 00			
Whatmough, C. T	Globes for lanterns	5 50			
Warwick, Wm., & Son	Binding	56 57			
Water-Works	Water supply, etc	1,000 00			
Wilson, James	Brushes	128 00			
Wilkes, R.	Clock, etc	9 40			
Waterman Bros.	Candles	61 56			
	Carried forward	30,946 91	16,929 38	303,999 52	1,055,493 28

PUBLIC INSTITUTIONS MAINTENANCE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	30,946 91	16,929 38	303,999 52	1,055,493 28
	CENTRAL PRISON MAINTENANCE.—*Continued.*				
Williams, J. M., & Co	Tinware	16 85			
Wilson, C., & Sons	Repairing scales	2 00			
Wilson, J., & Son	Books	5 00			
			30,970 76		
				47,900 14	
	CENTRAL PRISON INDUSTRIES.				
B. Mullin	Twelve months' salary as Accountant	999 96			
J. McGregor	do do Foreman tailor shop	600 00			
J. White	do do do shoe do	549 96			
H. Butwell	do do do brick-yard	615 00			
G. Miles	One do do shops	45 00			
J. Stafford	Seven do do do	295 65			
Foremen and instructors	Services	1,099 96			
			4,205 53		
Brandon, C. T., & Co	Broom-handles	110 50			
Burns, P.	Fuel	34 86			
Baines, E., & Co	Paints	165 78			
Cosgrove, Owen	Teaming	73 80			
Denison, C. L.	do	9 75			
Elliot & Co	Paints and oils	86 94			
Featherstonhaugh, W.	Sundry payments	39 59			
Fiskin, John, & Co	Oil	15 54			
Hallam, John	Leather, etc.	1,101 92			
Hughes Bros.	Cloth, thread, etc.	443 71			
Hewitt, Wm., & Co	Iron pipe, etc.	112 05			
Lander & Thornton	Castings	45 00			
Mullin, B.	Allowance for board	200 00			
McGill, W., & Co.	Wood	3,762 78			
McMaster, A. R., & Bro.	Cloth	1,547 98			
McGuire, W. J., & Co	Plumbing	365 81			
McLean, D	Leather	523 01			
Notman, J	Stationery	133 88			
O'Riley, E. P	Sand	8 00			
O'Reilley, P	Teaming	5 00			
Paterson, P., & Son	Hardware	216 37			

Rice Lewis & Son	Hardware	178 32			
Robertson, William	Broom-handles	8 10			
Robertson, James, & Co.	Re-cutting files, etc	29 20			
Sundry newspapers	Advertising	168 10			
Stock, J. B	Oil	30 59			
Snarr, Robert	Cartage of brick for drain	153 63			
Underwood, A. L	Lumber	394 09			
			9,964 30	14,169 83	
	REFORMATORY, PENETANGUISHENE.				
T. McCrosson	Eleven months' salary as Warden	1,466 63			
R. H. Stedman	do do Deputy Warden	550 00			
W. P. Band	do do Bursar	779 13			
P. H. Spohn, M.D.	do do Surgeon	458 26			
Rev. G. A. Anderson	do do Protestant Chaplain	366 63			
Rev. E. Kiernan	Seven do Roman Catholic do	233 31			
Rev. Father Allain	Four do do	316 67			
E. W. Murphy	Eleven do Protestant School-teacher	458 26			
T. J. Skilley	One do Roman Catholic do	41 66			
J. J. McGory	Six do do	249 96			
T. Quinn	Seven do Chief Guard	550 00			
W. Craig	Five do Superintendent of New Industries	229 15			
G. Miles	Six do do	237 07			
W. H. Smith	Eleven do Carpenter Instructor	458 26			
Hugh Clark	do do Cabinet Maker	458 26			
W. Waddell	do do Engineer	458 26			
A. Howe	Six do Baker	150 00			
R. Brown	One and one-half do	37 50			
W. Bantock	Three and one-half do	87 50			
D. Rae	Eleven months' salary as Cooper Instructor	367 63			
J. O'Byrne	do do Shoemaker do	366 63			
W. Stoddart	Three do Tailor do	124 98			
J. Jamieson	Eight do do do	333 28			
W. C. Drinnan	Eleven do Farmer	366 63			
Sundry persons	Wages of guards and other officers	4,358 14			
Anderson, Rev. G. A	Chapel expenses	2 00	13,503 80		
Allain, Rev. Father	Supplies R. C. Chapel	11 75			
Bailey, W. H	Harness	3 22			
Blind Institute	Clothing, etc	176 59			
Brown Bros	Stationery	61 70			
Band, W. P	To pay travelling expenses and wages	981 15			
do	Accountable warrant	250 00			
do	Sundry payments	907 05			
Bryce, McMurrich & Co	Clothing, bedding, etc	596 72			
Baines, E., & Co	Paints	25 41			
Blondin, C. S. D	Potatoes	88 51			
Barber Bros	Tweed	307 02			
Copeland, G	Corn meal	38 50			
	Carried forward	3,199 62	13,503 80	566,069 49	1,055,493 28

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	3,199 62	13,503 80	366,069 49	1,055,493 28
	REFORMATORY, PENETANGUISHENE.—*Continued.*				
Clark, J. & A	Oatmeal	18 60			
Clougher Bros	Books	18 05			
Clark, J	Furniture repairs	20 45			
C. P. Industries	Clothing	50 75			
Charlebois, T	Hay	28 86			
Croft, W., & Co	Machine needles	1 81			
Debeau, N	Teaming	105 00			
Darling, J. S	Postages, telegrams, etc	300 36			
Dickson, J	Lamp	10 50			
Ellis, W. E	Stationery	103 28			
Education Department	Books	133 87			
Firth, J	Meat	1,690 16			
Featherstonhaugh, W.	Freight, etc	1 35			
Gillespie, Mead & Co	Hats	32 25			
Greey, W	Services as foreman	2 00			
Gerouard, F. G.	Repairing saws	5 92			
Gibbons, C. H	Express charges	45 55			
Gendron, C. G	Leather	11 00			
Grossman, P	Repairing musical instruments	4 50			
Hughes Bros	Cloth	102 73			
Hewitt, W., & Co	Hardware	50 85			
Hollister, W	Services night-watch	253 25			
Hornsby, J	Services as fire-man	17 00			
Hatley, J. J	Stock	432 92			
Hart & Rawlinson	Books and maps	245 59			
Jeffrey, H. E	Fuel, etc	1,459 74			
Johnston, J. T	Whiting	20 02			
King, W	Hay	102 60			
Kiernan, Rev. E	On account rent	61 95			
Knowlton, W. W	Meals, etc	108 00			
Lewis, R., & Son	Hardware	1 00			
Lummis, W	Corn meal	212 88			
Morison, John	Groceries	558 69			
Miller, H., & Co	Coal oil	188 48			
Munday & Shanahan	Blacksmithing	106 42			
Morse, G. D., & Co	Soap	45 68			

Miller, Hugh, & Co	Oil	52 36		
Monkman, G.	Chemicals	28 50		
Myles, G. G	Churn	5 50		
McGrath, M. L.	Furnishings	20 49		
McRae, N	Flour	3,083 90		
McLean, D	Leather, etc	890 83		
McMillan, A	Repairing harness	48 75		
McMaster, A. R., & Bro	Clothing	1,358 19		
McCrosson, Thomas	Board, servants' wages, etc	326 00		
McLaughlin, S	Fruit	7 88		
Nicholson, W. M., & Son	Advertisements	16 90		
Nelson, H. A., & Sons	Brooms	115 53		
Notman, John	Stationery	107 60		
N. & N. W. R. R. Co	Freight	69 22		
Nerlich & Co	Base balls	4 00		
Parson & Harvey	Bacon	13 00		
Paterson, P., & Son	Hardware	3 50		
Piper, N. L., & Son	Furnishings	17 50		
Parker & Georgan	Groceries	11 80		
Robinson, C. B.	Printing	132 08		
Rolph, Smith & Co	Steel die	5 00		
Robertson, John, Son & Co	Dry goods	685 11		
Rennie, W.	Garden implements and seeds	21 98		
Rice Lewis & Son	Hardware	3 50		
Smith, A E.	Fish	70 00		
Simpson, T. W., & Co	Malt	13 94		
Smith, J.	Freight	166 80		
Smith, H.	Vegetables	60 12		
Stoddard, W.	Gratuity	50 00		
Spohn, Dr	Medical services	47 50		
Sirret Bros	Leather	45 00		
Saddler, H. J., & Co	Books	9 93		
Stedman, R. H	Supplies for Hospital	53 10		
Sinnot, J.	Services as guard	5 25		
Sundry newspapers	Subscription and advertising	3 00		
Thompson, H. H.	Flour, feed, etc	509 75		
Thompson, A. A	Furniture	38 80		
Tolmie, F.	Music	2 50		
Taylor, J	Plastering	5 00		
Wright, J. H	Furnishing	295 93		
Wright, James.	Meat	356 91		
Wheeler & Bain	Lamp shades, etc	194 41		
Warwick, William, & Son	Books	71 73		
Wynn, J	Supplies	7 35		
Wilson, J	Books	5 00		
Wright, C. E	Meat	21 48		
Young, J	Books	3 00		
			18,880 30	
				32,634 10
	Carried forward			398,703 59
				1,055,493 28

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward ..			398,703 59	1,055,493 98
	DEAF AND DUMB INSTITUTE, BELLEVILLE.				
R. Mathison	Twelve months' salary as Principal	1,599 96			
W. Hope, M.D	do do Physician	499 92			
A. Christie	Two do Bursar	133 32			
A. Livingston	Ten do do	666 60			
Mrs. M. Keegan	Twelve do Matron	300 00			
J. Middlemas	do do Engineer	600 00			
M. O'Meara	do do Farmer	399 96			
T. Wills	do do Gardener	300 00			
D. Cunningham	do do Baker	399 96			
H. Crebner	Three do Carpenter	137 49			
M. O'Dohohue	Nine do do	383 00			
John Flowers	Twelve do Shoemaker	199 92			
D. R. Coleman	do do Teacher	1,099 92			
J. Watson	do do do	999 96			
P. Deneys	do do do	900 00			
S. T. Greene	do do do	849 96			
J. J. Tirrell	do do do	600 00			
Miss M. Johnston	do do do	600 00			
R. J. Wallbridge	Eight do do	333 28			
Miss S. Templeton	Four do do	166 64			
Miss A. Symes	Twelve do do	360 00			
D. J. McKillop	do do do	199 88			
D. W. McDermid	do do do	233 28			
J. H. Brown	do do do	791 59			
Mrs. C. Walker	do do do	180 00			
Miss A. M. Perry	Eight do do	32 00			
Miss M. E. Lorriston	Four do do	40 00			
D. S. Canniff	Twelve do Visitors' attendant and clerk	183 26			
Sundry persons	Wages of other officers and servants	2,698 57			
			16,128 47		
Alcombrock, M.	Potatoes, etc	3 12			
Adams, F	Flower pots	1 50			
Allen, C	Services checking baggage	2 00			
Belleville Gas Co.	Gas and repairs	1,148 15			
Black, W	Fish, soup, etc.	13 50			

Bretton, E.	Meat	278 61			
Bryant, Jno.	Cutting ice	10 00			
Blind Institute	Baskets	9 00			
Brockville Chemical Co.	Chemicals	49 50			
Brown, G. & J.	Repairing boilers, pipe, tongs, etc.	48 96			
Brown Bros	Stationery	20 05			
Brown, J. H.	Travelling expenses with pupils	35 15			
Bell, D. C.	Books	3 00			
Baker, Pratt & Co	Coats	69 00			
Bonner, J. H.	Repairing furniture	4 50			
Baines, E., & Co.	Paints	12 97			
Bryce, McMurrich & Co.	Bedding, etc.	168 60			
Christie, A.	Sundry payments	137 03			
Cummings, W.	Services checking baggage	2 00			
Cook, Thos	Groceries	53 51			
Collector of Customs	Duties	51 33			
Carman, T. S.	Stationery and printing	339 81			
Corby, H., jun.	Flour	2,267 47			
Carson, R.	Butter, meal, etc.	212 53			
Conger Bros.	Fruit	273 72			
Carter, Mrs. E.	Potatoes	3 25			
Canniff, D. S.	Travelling expenses with pupils	20 05			
Colman, D. R.	Travelling expenses	15 20			
Carlyle, Jas.	Examiner's fee	50 00			
Donnelley, W.	Gravel	1 40			
Davis, C.	Potatoes and apples	112 32			
Dempsey, S.	Fruit	64 20			
Deneys, P	Travelling expenses with pupils	9 75			
Diamond, A	Books	5 00			
Davis, Wm.	Harness	35 00			
Express Co.	Charges	15 00			
Ewing Bros	Seeds	18 30			
Elliott, A.	Flower pots	4 55			
Educational Depository	Maps, etc.	38 70			
Fay, E. A.	Books	199 00			
Flint & Holton	Lumber	159 33			
Flowers, Mrs.	Making clothes	2 50			
Finkle, Mrs.	Honey	1 50			
Ford, J. H.	Frames	18 40			
Gibson, Geo. W.	Meat, etc.	2,436 71			
G. T. Railway	Freight	26 86			
Grafton, T. E.	Books, etc.	42 04			
Gilbert, B. G.	Dentistry	20 75			
Graham, John	Wood	859 00			
Green, S. G.	Travelling expenses with pupils	14 10			
Greatrix, R.	Bread	7 40			
Gallagher, J.	Travelling expenses	8 00			
Graham, R.	Fruit	21 25			
Graham, D.	Soap	12 04			
	Carried forward	9,436 61	16,128 47	398,703 59	1,055,493 28

PUBLIC INSTITUTIONS MAINTENANCE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	9,436 61	16,128 47	398,703 59	1,055,493 28
	DEAF AND DUMB INSTITUTE, BELLEVILLE.—*Continued.*				
Hayne, E.	Hams	13 44			
Holton Bros. & Co.	Clothing	131 23			
Haldon, S.	Potatoes	7 15			
Harrison, E.	Stationery	7 30			
Hambly, P. H.	Bread	4 60			
Howard, D.	Pump	6 65			
Intelligencer Pub. Co.	Directories	12 00			
Ives, H.	Apples	20 00			
Ives, Wm.	Potatoes	20 46			
Jones, N.	Clothing	178 55			
Jones, H.	Apples	40 81			
Johnston, A.	Turnips	2 00			
Jellet, John	Ferrying	5 00			
Jones, A. S.	Seeds	5 40			
Kleingbeil, F.	Milk	8 40			
Keep, J. R.	Books	22 00			
Lewis, John	Hardware, locks, etc.	253 01			
Lang, Charles	Whitewashing and plastering	159 00			
Lazier & Foster	Lime	1 62			
Leavens, H. H.	Fish	4 80			
Livingston, A.	Sundries and rent	315 17			
Leavens & Roblin	Fish	63 30			
Latta, George	Potatoes	3 50			
Logan, G. W.	Services	25 00			
Morden, M.	Fruit	5 25			
Montreal Telegraph Co.	Telegrams	18 57			
Mathison, R.	Travelling expenses, sundry payments	70 13			
Meagher, M. F.	Oats	645 48			
Miller, A.	Potatoes	9 80			
Maybee, Samuel	do	20 30			
Monroe, James	do	4 55			
McRae, W. R., & Co.	Groceries	1,653 52			
McCoy, James	Cutting wood, ice, etc.	13 50			
McMahon, M.	Manure	15 00			
McCornock, G. L.	Piano hire, patterns, etc.	17 76			
McDougall, Mrs. T.	Travelling expenses	2 20			

McInnich, H	Blacksmithing	41 20		
McKay & Stalker	Furnishings	6 90		
McArthur, Ned	Repairing harness	6 25		
McDermid, D. W	Travelling expenses with pupils	20 95		
McCammon, C. S	Manure	7 50		
Nelson, H. A., & Sons	Brooms	54 69		
Notman, J	Stationery	114 59		
Nasmith, D. L	Fruit and pastry	6 62		
Overell, J. C	Stationery	9 65		
Orr, James	Teaming	7 00		
Ottoman Cahvey Co	Coffee	64 74		
O'Brien, P	Manure	20 50		
Price, D	Hardware and locksmithing	62 52		
Ponton, W. H	Rent	15 00		
Plasse, M. A	Fish	130 15		
Postmaster	Rent of box	2 00		
Patterson, Wm	Biscuits	12 92		
Post, N	Altering beds	4 50		
Potter, C	Lanterns	8 00		
Reeves, W. S	Blacksmithing	13 22		
Ritchie, George, & Co	Dry goods, etc	552 57		
Rous & Co	China	207 95		
Ross, George	Fowls	34 00		
Robinson, A	Books, stationery, etc	533 99		
Ross & Davies	Provisions, etc	47 34		
Rankin & Stephenson	Castings	17 28		
Ross, R. R	Poultry	3 60		
Robinson, C. B	Printing	23 91		
Rathbun, H. B., & Co	Fuel	2,671 10		
Sundry newspapers	Subscription and advertising	56 34		
Smith, E. F	Plumbing etc	289 37		
Singham, W	Corn, etc	12 79		
St. Charles, James	Blacksmithing, etc	207 10		
Shanks, R. H	Electric pen, etc	53 00		
Smith, Thomas	Potatoes	3 50		
Steamer "Alexander"	Excursion for pupils	40 00		
Shoe Shop	Boots, shoes, etc	473 27		
Salvin, John	Cutting wood	2 00		
Shearing & Painter	Hams	2 52		
Severn, W	Malt	0 75		
Templeton, W. jr	Groceries	103 12		
Templeton, R	Medicines, drugs, etc	168 46		
Taylor, L	Fish	14 10		
Tarlington, John	Teaming	4 00		
Tickell, G. S	Furniture	125 00		
Taylor, C. B	Threshing grain	6 87		
Union Oil Co	Soap	93 00		
Vantassel, W. H	Apples	10 25		
Warwick, Wm.,& Son	Binding	13 22		
	Carried forward	19,602 39	16 128 47	398,703 59	1,055,493 28

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	19,602 39	16,128 47	398,703 59	1,055,493 28
	DEAF AND DUMB INSTITUTE, BELLEVILLE.—*Continued.*				
Watson, James	Travelling expenses with pupils	20 25			
Whitaker, Wm	Furniture	7 50			
Wharin, R	Painting and whitewashing	74 00			
Wallace, J. G. A	Butter, etc	1,879 66			
Walker, J. W	Plumbing	50 60			
Wedd, T	Books	1 00			
Wattles, W. G	do	4 10			
Walker, J. M	Repairing implements	84 27			
Wallbridge, R. J	Travelling expenses with pupils	9 10			
			21,732 87		
				37,861 34	
	INSTITUTION FOR THE BLIND, BRANTFORD.				
J. H. Hunter, M.A	Twelve months' salary as Principal	1,599 96			
W. N. Hossie	do Bursar	950 04			
W. C. Corson, M.D	do Physician	500 02			
M. Spaight	do Matron	360 00			
M. D. Tyrril	do Teacher	733 32			
W. Wickens	do do	699 96			
E. E. Montgomery	do do	449 99			
M. Forster	do do	383 30			
J. L. Edgar	do do	300 00			
E. Moore	do do	300 00			
T. Truss	do Trade Instructor	999 97			
P. Mahoney	Eight do Music Teacher	333 36			
J. A. Zinger	Three do do	166 65			
E. Jones	Twelve do do	399 97			
M. E. Nolan	Six do do	166 68			
M. Cronk	Nine do Music Reader	47 97			
T. Harrison	Twelve do Engineer	600 00			
G. S. Lamdon	do do Carpenter	399 96			
H. Thompson	do do Gardener	360 00			
J. Grierson	do do Baker	360 00			
Sundry persons	Wages, other officers and servants	3,793 39			
			13,844 54		

Aikenhead & Cromie	Hardware	22 11			
American Printing House for the Blind	Books	37 40			
Arnold, Geo	Clothing	6 00			
Bishop, John	Hardware	62 98			
Baldwin, M. D.	Fruit	1 88			
Brethour & Co	Dry goods	214 43			
Blacker, J	Fuel	281 00			
Bowes, J	Meat and fruit	16 60			
Bennett, A. B	Medicine	27 45			
Baines, E., & Co	Paints	18 44			
Burke, D	Potatoes	5 40			
Beemer, L. J	Boots and repairs	18 45			
Bruce & Co	Grass shears, plants, etc	2 75			
Batchelor, W. A	Books	5 00			
Bell Telephone Co	Rent of box	14 58			
Blackadar & Mills	Medicines	18 73			
Buck, Wm	Furniture	22 46			
Collector of Customs	Duties	35 19			
Cowherd, James	Fruit	6 00			
Cregk, James	Clock repairs	2 65			
Creelman Bros	Needles	2 62			
Callis, Thomas	Ice	9 50			
Chickering & Sons	Piano furnishings	3 00			
Cockshutt, J. G.	Plough, etc	18 48			
Cowherd, T., & Sons	Tinware	6 65			
Champion, C.	Hardware	15 23			
Dominion Telegraph Co.	Telegrams	27 54			
Dana Bickford Mnf'g Co	Needles	10 08			
Dempster, G., & Co	Repairing buffalo robes	3 50			
Daniells, J.	Repairing harness	18 85			
Dalrymple, W.	Lumber	6 70			
Express Company	Charges	13 30			
Ellis & Wallis	Drugs, etc	16 81			
Edgar, John, & Son	Crockery	11 18			
Elliott, Thomas	Cement and lime	6 05			
Finkle, A., & Co	Gas	1,095 71			
Foster, George	Butter, eggs, etc	1,594 12			
Fawcett, J.	Fruit	33 00			
Flemming, W.	Repairs to furnaces	1 15			
Great Western Railway	Freight	16 85			
Grant, William	Dry goods	55 03			
Grand Trunk Railway	Freight	11 49			
Goold, E. L.	Hardware	53 92			
Grace Church	Use of organ	16 66			
Grummett, W.	Feed and fodder	11 50			
Greerson, J.	Fruit	5 00			
Grossman, P.	Music	16 31			
Hossie, W. N.	Officers' travelling expenses	236 06			
	Carried forward	4,135 79	13,844 34	436,564 93	1,035,493 28

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	c.
	Brought forward	4,135 79	13,844 54	436,564 93	1,055,493 28
	INSTITUTION FOR THE BLIND, BRANTFORD.—*Continued.*				
Hossie, W. N.	Sundry payments	242 50			
Hunter, J. H.	Travelling expenses	123 00			
Hill, George	Apples	15 60			
Harrington, W.	Ice, teaming, etc	7 50			
Hay, J. B.	Seeds, fruit, etc	55 22			
Heaton, C., & Son	Repairing shoes	11 78			
Hardy, George	Fruit, etc.	33 16			
Hunt & Bennett	Teaming	2 00			
Houghton, Osgoode & Co.	Dwight's Journal of Music	2 50			
Hatcher, W. R.	Straw	4 50			
Ivery, Thomas A.	Bread	14 70			
Jenkins, John	Clothing	11 00			
Jackson, Ford & Son	Groceries	33 50			
Jaffray Bros.	Type	6 50			
Keith, D. S., & Co.	Valve	1 25			
Kneass, N. B.	Magazines	41 30			
Kelley, James	Seed potatoes	8 25			
Kester, E.	Sewing machine furnishings	2 25			
Long & Heaton	Fruit	5 92			
Leslie, E. W.	Needles, etc.	6 00			
Mason, C. S., & Co.	Paints, oils, and chemicals	69 88			
Montreal Telegraph Co.	Telegrams	2 27			
Morton, J. G.	Hardware	63 79			
Mott, A.	Ice	10 50			
Morison, James	Brass-fittings	3 25			
Mann, John	Coal	3,054 45			
Munroe, J. R.	Tea	16 80			
Morse & Co., G. D.	Soap	10 60			
Mason & Risch	Repairing pianos	45 60			
McDonald, Geo.	Meal	4 40			
McGeary, John	Groceries	546 51			
McLean, Thomas	Clothing	58 70			
McHaffie, W.	R. R. Guide	18 00			
Maclear & Co	Book	3 50			
McLean, Roger & Co	Books	2 50			

Norrie & Co	Wood	3 00			
Nelson, H. A., & Sons	Brooms and pails	25 38			
New York Blind Institution	Paper	27 50			
Nellis, A	Hay	11 05			
Nutt, Wm	Wire guards	5 50			
Oakley & Keating	Wringer-shafts	15 00			
Parsons John	Butter	998 92			
Plewes, D	Flour, etc	1,553 67			
Palmer, S	Fish	102 97			
Postmaster	Postage	36 50			
Peatman, N. T	Iron boiler	3 00			
Perkins' Institute	Books	148 59			
Popplewell, A	Chemicals, etc.,	17 70			
Petrie, H. W	Steel dies	2 00			
Rothwell, B. H	Newspapers	125 94			
Russell, Robert	Steam-fittings	60 88			
Robinson, C. B	Printing annual report	40 00			
Ramsey, Thomas	Carpentering	5 40			
Rolph, Smith & Co	Stamping	8 00			
Ranon, B	Organ instruction	2 00			
Smith, James	Meat, etc	2,372 27			
Shuttleworth, J. R	Fruit	79 55			
Sutherland, J	Stationery and binding	66 32			
Spence, A	Repairing sleighs	73 52			
Strickland, John	Hay	16 63			
Stratford, Joseph	Drugs, etc	121 66			
Sigman John	Repairing furnaces	10 00			
Sailes, S	Straw, Ice, etc	92 63			
Sundry persons	Manure	60 30			
Sundry newspapers	Subscriptions and advertisements	52 55			
Steward, James G	Blacksmithing	29 71			
Stapleton & Agnew	Shoes	34 41			
Smith, F. A	Fruit	3 75			
Scott, A. G	Cab-hire	1 00			
Steele, J. C	Groceries	11 48			
Society for providing cheap literature for the blind	Books	90 61			
Turner, R	Groceries	428 30			
Tisdale, B. G	Repairing furniture	10 92			
Tainsh, J	Glass	11 25			
Taylor, J. H	Straw	1 75			
Tapscott, S	Chemicals	23 39			
Thompson, S. J	Hay	10 75			
Taylor & Green	Printing and stationery	10 00			
Taylor, J	Baskets	12 40			
Union Oil Co	Soap stock	30 67			
Workshop	do	14 25			
Watt, W., jr	Clothing	176 11			
Wesley, J. H	Veterinary services	6 70			
	Carried forward	15,700 28	13,844 54	436,564 93	1,055,493 28

PUBLIC INSTITUTIONS MAINTENANCE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	15,700 28	13,844 51	436,564 93	1,055,493 28
	INSTITUTION FOR THE BLIND, BRANTFORD.—*Continued.*				
Welding, W. E	Fire-brick and clay	10 50			
Watt, Wm	Lumber	77 34			
Waterous Engine Works Co.	Brass, and repairing machinery	140 57			
Williams, Geo	Hay	24 91			
Willing & Williamson	Books and magazines	54 41			
Witham, M	Dry goods	6 42			
Wood & Legat	Music wire	4 50			
Wickens, W	Travelling expenses	125 88			
Whitaker, S	Bread	26 00			
Wickham, W. T	Groceries	107 62			
Workman & Watt	Brick	16 00			
			16,294 43		
	SCHOOL OF AGRICULTURE, GUELPH.			30,138 97	
J. Mills	Eleven months' salary as President	1,833 34			
W. Brown	Twelve do Professor of Agriculture	2,000 00			
J. H. Panton	Eleven do do Chemistry	916 67			
E. A. A. Grange	do do do Veterinary Science	550 00			
A. A. McTavish	do do Mathematical Master	458 34			
P. Mahon	Five do Farm Foreman	235 00			
P. J. Woods	Six do do	300 00			
J. F. Barron	Four do Gardener	200 00			
J. Forsyth	Seven do do	350 00			
J. McIntosh	Eleven do Carpenter	550 00			
E. W. McGuire, M.D	do do Physician	275 00			
T. Johnston	do do Bursar	458 34			
M. B. Dunn	do do Matron	366 67			
J. A. Angell	do do Engineer	458 34			
W. Squirrell	do do Assistant Engineer	200 00			
Alex. Fyfe	Four do Fireman	48 00			
Andrew Fyfe	do do Messenger	40 00			
J. Moyse	Six do do	67 00			
J. A. McLennan	Eleven months' salary as Cook	132 00			
M. A. Callaghan	Seven do Assistant Cook	70 00			
M. McLennan	Eight do do	58 00			

M. A. Bates	Two	do	do	5 00			
E. Speers	Eleven	do	Assistant Matron	110 00			
M. Gairns	do	do	Laundress	92 00			
F. Robins	Three	do	do	14 75			
F. Moore	One	do	do	8 00			
A. Reynolds	Five	do	do	50 00			
S. Duncan	Five	do	do	45 50			
M. Campbell	Four	do	do	25 00			
J. Corridi	Two	do	Housemaid	16 00			
M. E. Hart	One	do	do	12 00			
N. Barber	One	do	do	4 00			
M. Kee	Ten	do	do	80 00			
M. Minthorne	One	do	do	4 00			
F. Jeffers	Eleven	do	Tablemaid	88 00			
M. Hood	Six	do	do	46 15			
A. Williams	One	do	do	4 00			
S. Jeffers	Eleven	do	do	88 00			
A. Rule	One	do	do	4 00			
J. Fold	Three	do	Dairymaid	24 00			
E. Brown	Ten	do	Housemaid	60 00			
J. Congalton	Eleven	do	do	88 00			
E. McMahon	One	do	do	4 00			
Sundry persons	Wages for labour			15 00			
					10,454 10		
Allworth, J. S	Books			18 00			
Burr & Skinner	Furniture			37 05			
Bond, J. M., & Co.	Hardware			225 87			
Brown, William	Provisions			19 90			
Brown, S.	Whitewashing			2 00			
Brown, William	Travelling expenses			14 00			
Brown, W., jun.	Services *re* experimental plots			54 20			
Barron, J. F.	Milk			44 60			
Beatty & Dyson	Repairing harness			5 25			
Buchan, A. O.	Furnishings			2 60			
Brown, A. J.	Plastering, etc			59 35			
Chase, C.	Repairing carriages			38 05			
Chapman, F. T.	Books			10 00			
Day, T. J.	Books, etc			152 53			
Dawes, W. A.	Services, dairy			10 00			
Duncan, C.	Dry goods			3 00			
Dunn, M. B.	Fruit			19 38			
Day, William	Plastering			6 75			
Davis Miss E.	Clothing			8 50			
Education Department	Stationery			15 75			
Ellis, F. P.	Ice			43 25			
Ewing, J.	Cab-hire			7 30			
Express Company	Charges			2 65			
Fraser, G. B.	Groceries, etc			194 08			
Fire Extinguishing Co.	Extinguisher			9 00			
	Carried forward			1,003 06	10,454 10	466,703 90	1,055,493 28

PUBLIC INSTITUTIONS MAINTENANCE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	1,003 06	10,454 10	466,703 90	1,055,493 28
	SCHOOL OF AGRICULTURE, GUELPH.—*Continued.*				
Fletcher, A.	Painting	10 00			
Farmer, W.	Plumbing	47 49			
Grand Trunk Railway	Freight	47 88			
Guelph Lime Co	Lime	1 50			
Gilchrist, A.	Fruit	2 75			
Guelph Gas Co	Gas	170 02			
Hart, M.	Laundry services	3 25			
Harris, J	Bread	47 08			
Howard, G.	Furnishings	81 88			
Horsman, J	Hardware	32 88			
Hewer, J.	Corn	59 02			
Holterman, R. F.	Services, superintending dairy	47 00			
Hogg & Son	D y goods	135 72			
Howett, Wm.	Services re experimental plots	26 00			
Innes & Davidson	Stationery	206 25			
Johnston, Thomas	Sundry payments	348 70			
Jacombe, W. H.	Painting	9 59			
Johnston, W.	Furniture	18 00			
Kleopper, C	Fuel	1,189 19			
Little, W. J	Bread	1 20			
Millar, J & R.	Meat	1,966 85			
Mills, W. H	Tinsmithing	57 41			
Mills, J.	Travelling expenses, etc	53 07			
Mahon, P.	Potatoes	14 00			
Montreal Telegraph Co	Telegrams	12 78			
Murton, G., sen	Fuel	117 77			
Metcalf, H	Harness	22 00			
Marot, C. H	Books	60 00			
McGuire & Co.	Hardware	126 68			
McBean & Co	Glass, etc	57 21			
McIlquhan, W	Carpentering	10 00			
McGinnis, J.	Teaming	31 25			
McLennan, G.	Groceries	22 50			
McTavish, A. A	Sundry payments	3 40			
Naismith, D	Poultry, etc	272 34			
Nichol, A.	Services	306 00			

Notman, J.	Stationery	22 85			
Newport, W.	Cakes	6 20			
Petrie, A. B.	Drugs, etc	29 97			
Potter, C.	Instruments	40 50			
Pringle, G. D.	Repairing clocks	6 00			
Phin, J.	Potatoes	30 00			
Pope, H.	Services	8 75			
Postmaster	Postage	35 50			
Ponton, J. H	Allowance for board	75 00			
Robinson, C. B.	Printing	10 50			
Rennie, W	Oil-cake, etc	51 47			
Robins, F	Services at Laundry	5 00			
Rolph, Smith & Co	Dies	5 00			
Risk, J.	Glassware	2 59			
Smith, W. G., & Co.	Medicine	15 62			
Sole & Johnston	Bread	764 58			
Stewart, R.	Sash, lumber, etc	38 58			
Sundry newspapers	Advertisements	200 81			
Secord, Cousins & Co	Lumber	9 25			
Steele Bros., & Co	Implements	13 00			
Smith, R.	Ice	1 10			
Squirrell, Wm.	House-cleaning	20 00			
Slingsby & Sons	Blankets	10 64			
Stewart, G. B.	Whitewashing	29 00			
Thompson, J.	Fruit	33 03			
Thompson, S. J.	Commission	15 00			
Thomson, J.	Lumber	324 15			
Vennables, S.	Whitewashing	1 25			
Wood, J. A	Groceries	2,659 69			
Worspole, J., & Co	Furniture	23 75			
Walker, H.	Meat	73 66			
Williams, T	Locksmithing	5 20			
			11,189 36		
	EXPERIMENTAL FARM.				
Abel, J	Implements	46 40			
Bond, J. M., & Co.	Hardware	64 64			
Beatty & Dyson	Harness, etc.	139 25			
Barron, J. F.	Account of rent	10 00			
Brown, W.	Travelling expenses	18 45			
Barber, G. S.	Implements	27 20			
Bruce, G. & A.	Carpentering	8 00			
Brown, Wm.	Expenses, *re* cattle	137 24			
Chase, C	Repairing carriages, etc	57 07			
Collins & O'Connor	Blacksmithing	5 90			
Clark, A.	House rent	5 00			
Carter, W.	Oats, etc	32 20			
Davison, S	Straw	37 00			
	Carried forward	614 35	21,643 46	466,703 90	1,055,493 28

PUBLIC INSTITUTIONS MAINTENANCE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	614 35	21,613 46	466,703 90	1,055,493 28
	EXPERIMENTAL FARM.—*Continued.*				
Day, T. J	Stationery	15 78			
Daines, M. A	Services in dairy	21 00			
Dana, C. H	Labels	3 00			
Davidson, Thos	Peas	11 43			
Estate of O. McDonald	Repairing pump	9 50			
Eustace, J	Seeds	11 90			
Express Co	Charges	1 65			
Fitzgerald, M	Manure	12 00			
Foster, J	Manure	47 00			
Fitzgerald, J	Account, rent	30 00			
Feek, G	Repairing pump	2 00			
Fraser, G. B	Bags	22 89			
Goldie, J	Bran and shorts	179 96			
Gilchrist Bros	Straw	18 00			
G. W. Railway	Freight	18 36			
G. T. Railway	Freight	28 15			
Greene, A. D., & Co	Coal oil	2 40			
Gowdy, Thomas	Implements	19 10			
Glennie, J	Straw	20 00			
Grange, E. A. A	Veterinary services	15 30			
Grant, P., & Sons	Repairs to pump	6 75			
Hunter, J. & R.	Stock, etc	322 00			
Hewer, J	Seeds	135 80			
Horsman, J., Estate of	Hardware	55 78			
Hogarth, S. J	Services as labourer	5 00			
Howitt, W	Dairy services	20 00			
Haddon, G. & A	Cloth	0 78			
Hogg, J	Bags and twine	17 10			
Ingles & Hunter	Apparatus, etc	67 22			
Innes & Davidson	Printing	65 50			
Johnston, Thomas	Sundry payments	67 61			
do	To meet pay lists	2,968 10			
Joyce, H. G	Services as gardener	24 78			
Johnston, A	Stock	110 00			
Kennedy, B	Bricklaying	38 00			
Kennedy, A. H. K	Plaster and salt	83 20			

Lenard & Son's	Barrels, etc	5 00			
Lock & Galbraith	Baskets, etc	10 70			
Ludlow, J	Manure	0 75			
Lomis, J. W	Carpentering	15 00			
Little, R	Bags and twine	28 00			
Marcon, W. H	Flower pots	171 44			
Mercer, J	Lumber	70 20			
Mills, W. H	Tinware	82 30			
Mahon, P	Account of rent	10 00			
Malcolm, R	Canvas for waggon cover	14 00			
Mulroney, J	Seed grain	5 10			
Mickle Estate	Lumber	7 06			
Merlehan, T	Manure	40 00			
Mirton, H	Peas	45 25			
Miller, J. & R	Supplies, sale luncheon	11 80			
Massey Manufacturing Co	Implements	3 95			
McBean, A. & C	Hardware	226 42			
McGibbon, P	Repairs, implements	19 00			
McGinnis, J	Labour	24 00			
Natrass, J	Seeds	15 60			
Noxon Bros	Implements	10 50			
Naismith, D	Supplies, sale luncheon	9 44			
Petrie, A. B	Chemicals	16 55			
Packer, W	Carpentering	35 62			
Peterson, H. W	Rent foreman's house	35 00			
Ponsford & Co	Chemicals	3 00			
Paskin & Royal	Tiles	7 50			
Presant Bros	Feed	7 60			
Patterson J. J	Painting	3 00			
Rennie, W	Oats, etc	341 82			
Squirrell, W	Whitewashing	11 00			
Sundry persons	Services on farm	147 14			
Smith, W. G., & Co	Chemicals	27 30			
Sallowes, W	Blacksmithing	263 50			
Seegmiller, Carter & Co	Plough	16 00			
Smith, A	Veterinary services, horse, etc	145 00			
Secord, Couzins & Co	Lumber	16 53			
Sundry newspapers	Advertisements	215 65			
Stovell, E	Repairing pump	27 50			
Stewart, R	Lumber	22 74			
Stewart, J	Manure	9 75			
Slennie, G	Supplies, sale luncheon	7 00			
Sole & Johnston	Bread, sale luncheon	6 64			
Thompson, J	Lumber	404 34			
Tolton, A. & W	Feed	43 79			
Thorley Horse and Cattle Feed Co	Fodder	18 00			
Taylor, J	Fees as auctioneer	33 42			
Watson, J	Hardware	7 40			
	Carried forward	7,792 69	21,643 46	466,703 90	1,055,493 28

PUBLIC INSTITUTIONS MAINTENANCE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	7,792 69	21,643 46	466,703 90	1,055,493 28
	EXPERIMENTAL FARM.—*Continued.*				
Wood, J. A	Baskets, etc	48 14			
Welsh, J	Cab-hire	3 00			
Walker, B., & Sons	Bread	2 04			
			7,845 87		
			29,489 33		
	Less amount received on account of revenue		7,501 53		
				21,987 80	
	SCHOOL OF PRACTICAL SCIENCE.				
J. Galbraith	Twelve months' salary as Professor of Engineering	1,800 00			
W. H. Ellis	do Assistant in Chemistry	1,500 00			
H. Manly	do Attendant	450 00			
			21,987 80		
Allen, E. G	Books	28 09			
Burns, P	Fuel	33 15			
Baker, A	Freight, duties, etc	50 00			
Chapman, B	Repairing clocks	3 00			
Consumers' Gas Co	Gas	45 36			
Foster, J	Instruments	27 75			
Friedlander, R., & Son	Books	59 80			
Guttapercha M. Co	Tubing	4 54			
Hooper, E., & Co	Chemicals	22 58			
Iredale, J	Tinsmithing	48 90			
Lyman Bros. & Co	Chemicals	113 53			
Murray, G. & J	Lamp goods	4 19			
Morrison, J	Furnishings	3 60			
Marguart, L. C., Dr	Chemicals	8 69			
McConnell, T., & Co	Wood	17 75			
Notman, J	Stationery	54 48			
Pearsall, G	Hardware	37 68			
Rohrbeck, W. J	Chemicals	42 00			
Robinson, C. B	Printing	30 64			
Richards' Bros	Tinsmithing	29 73			
Rowsell & Hutchison	Printing	12 80			

Rathbun, H. B., & Sons	Fuel	308 40		
Sundry newspapers	Advertising and subscriptions	32 94		
Shapter & Jeffrey	Chemicals	11 55		
Smith, J. B	Lumber	22 67		
Sewell, Robert	Repairs to furnace	3 25		
Sparrow, W. H	Furnishings	14 95		
Water-works	Water	87 75		
Wright, R. R	Duties, express, etc	175 00		
Willing & Williamson	Books, etc	39 31		
Warwick, W., & Son	Binding	15 42		
Wright, R. R	Services and expenses as secretary	265 00		
			1,654 50	
				5,404 50

MERCER REFORMATORY FOR FEMALES.

M. J. O'Reilly	Eight months' salary as Superintendent	463 54		
E. Laird,	do do Assistant do	347 67		
R. W. Laird	Seven do Bursar	300 00		
M. Meehan	Three do School Mistress	50 00		
G. Coady	do do do	75 00		
L. Tyrell	do do Instructress	24 99		
J. S. King, M.D	Five do Physician	266 65		
H. W. Dillon	Eight do Engineer	415 01		
V. Fayle	Six do Night-watchman	172 21		
M. Casey	Three do Cook	24 50		
A. Mullen	Five do Messenger	66 68		
Sundry persons	Wages of other officers and servants	503 00		
			2,709 25	
Bilton, Mrs. W	Fruit	24 03		
Burns, C	Ice	2 50		
Brown Bros	Blank books	4 50		
Bryce, McMurrich & Co	Yarn	112 09		
City of Toronto	Extension of water mains	2,600 00		
Consumers' Gas Co	Gas	26 43		
Cato, John, & Co	Scourers	8 28		
Clark, John	Vegetables, etc	24 03		
Dunn, J. [illegible]	Hay and straw	39 40		
Dempster, John	Bread	48 11		
Eby, Blain & Co	Groceries	1,008 07		
Edgar, John, & Son	Crockery	30 90		
Elliott, Miss	Travelling expenses	11 05		
Express Co	Charges	2 20		
Elliot & Co	Chemicals	9 15		
Hughes Bros	Clothing	35 76		
Harding, John	Plumbing	55 66		
Jackman & McCuaig	Potatoes	12 00		
Jackman & Low	do	72 00		
Knowlton, W. H	Fuel, flour, etc	2,644 02		
Kennedy, D	Sawdust	1 60		
	Carried forward	6,771 78	2,709 25	494,096 20

1,055,495 28

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	6,771 78	2,709 25	494,096 20	1,055,493 28
	MERCER REFORMATORY FOR FEMALES.—*Continued.*				
Laird, Mrs. R. W.	Travelling expenses	75 00			
Laird, R. W.	Accountable warrant	250 00			
do	Sundry payments	27 29			
Morse, G. D., & Co	Soap	21 24			
Mallon, J. D., & Co	Meat	157 33			
Mercer Reformatory	Making clothing	131 34			
McCann, Rev. J. J.	Cab-hire for clergy	25 00			
McMaster, A. R., & Bro.	Dry goods	105 81			
Notman, J.	Stationery	127 42			
Newton, T. B.	Milk, eggs, etc	38 64			
Nelson, H. A., & Sons	Brushes	50 31			
O'Reilley, M. J.	Travelling expenses	100 00			
Park, James	Butter, eggs, etc	84 84			
Pape, James	Fruit	6 46			
Piper, N. L.	Lanterns	3 20			
Parker & Evans	Boiler compound	40 80			
Robinson, C. B.	Printing	88 24			
Ryan, W.	Flour, fruit, etc	39 00			
Roseburgh, A. M., M.D.	Cab-hire for Sunday-school teachers	62 50			
Russell, J. T.	Crocks	2 25			
Roberts, John	Locksmithing	4 25			
Rye, Miss	Peaches	3 00			
Sundry newspapers	Advertising	23 30			
Sanborn, F. B.	Books	9 95			
Snarr, Robert	Erecting range	25 03			
Treasurer City Toronto	Sidewalk	256 98			
Warwick, W., & Son	Binding, etc	185 47			
Wood, R. A.	Chemicals	63 23			
Wilson, J., & Son	Books	10 00			
Wilkinson & Co	Bell	2 25			
Wheeler & Wilson	Oil	1 05			
			8,792 96		
				11,502 21	
	Total Public Institutions Maintenance				505 598 41

IMMIGRATION.

AGENCIES IN EUROPE.

P. Byrne	Services	2,000 00		
do	Travelling expenses	841 11		
do	Sundries	1,733 89		
L. H. Irving	Services as clerk	200 00		
Globe Printing Co	Subscriptions	6 00		
G. H. Wyatt	Advertising	25 00		
			4,806 00	

AGENCIES IN ONTARIO.

R. M. Persse	Services forwarding immigrants	1,000 00		
E. Jenkinson	do as Clerk	500 00		
S. J. Muir	do as Constable	56 10		
A. Lundin	do as Interpreter	4 00		
G. G. Laird	do do	201 30		
F. A. Foley	Services, Agent, Parry Sound	100 00		
W. E. Hamilton	do do Bracebridge	100 00		
J. Sharp	do do Gravenhurst	100 00		
E. Sirrett	do do Rosseau	100 00		
Sundry newspapers	Advertising	55 75		
R. M. Persse	Travelling expenses and expenses at Quebec Office	686 33		
			2,903 48	

FORWARDING IMMIGRANTS TO ONTARIO.

Hon. Minister of Finance	To cover Ontario's share of expenditure incurred in forwarding immigrants		20,000 00	

CARRIAGE OF IMMIGRANTS.

Toronto, Grey & Bruce R'y	Carriage of immigrants	333 45		
Grand Trunk Railway Co	do	2,389 12		
G. W. Railway Co	do	3,271 14		
Northern & North-western R.	do	1,358 64		
Canada Southern Railway	do	188 15		
Whitby, Port Perry & Lindsay Railway	do	3 05		
Canada Central Railway	do	210 75		
St. Lawrence & Ottawa R'y	do	40 56		
Midland Railway Co	do	28 00		
Toronto & Nipissing R'y	do	56 27		
Welland Railway	do	22 85		
	Carried forward	7,901 98	27,709 48	1,561,091 69

IMMIGRATION.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Carried forward		7,901 98	27,709 48	1,561,091 69
	CARRIAGE OF IMMIGRANTS. *Continued.*				
Port Dover & Huron Railway	Carriage of immigrants		1 80		
Hamilton & Dundas do	do		1 50		
Kingston & Pembroke do	do		9 20		
Grand Junction do	do		13 60		
Georgian Bay Transportation Co	do		82 00		
Lake Superior Transit Co	do		28 75		
Steamer *Hastings*	do		53 05		
do *City of Toronto*	do		4 00		
do *Hero*	do		3 25		
do *Picton*	do		2 00		
do *Rothesay*	do		33 80		
Niagara Navigation Co	do		27 00		
A. G. Smith	do		8 10		
S. Thompson	do		3 00		
Wilson & Davis	do		17 50		
A. D. Stewart	do		4 00		
B. Cumberland	do		669 50		
E. Sirrett	do		6 60		
A. P. Cockburn	do		4 00		
T. Coombs	do		9 50		
C. H. Hatch	do		11 50		
M. Henderson	do		9 50		
A. G. Smith	do		15 20		
J. Sharp	do		7 00		
R. McPherson	do		25 70		
P. Hickey	do		16 75		
J. Fleming	do		59 00		
J. Smith	do		23 60		
Sundry persons	do		14 40		
L. Lambalet	do		12 23		
G. G. Laird	Services and travelling expenses		230 25		
G. Verral	Cab-hire		2 35		
J. Jordan	Cartage		10 25		
				9,321 76	

	PROVISIONS, MEDICAL ATTENDANCE, &c.				
C. Ruse	Provisions	1,667 86			
J. Mallon	do	670 93			
B. Goodman	do	399 48			
McEachern Bros	do	50 00			
J. Wornock	do	15 79			
Dill & Kirk	do	15 72			
W. O'Connor	do	59 53			
W. J. Wills	do	54 58			
J. Casey	do	4 00			
W. Tofield	do	111 88			
W. McNeal	do	123 00			
J. Ritchie	do	169 42			
			3,342 19		
E. H. Hodgins	Meals, lodgings, etc	595 00			
George Begg	do	2 28			
M. A. Kitchen	do	227 80			
H. Potter	do	8 00			
Mrs. E. Sinnott	do	17 75			
Mrs. F. Austiss	do	133 53			
F. Kilby	do	4 00			
M. Henderson	do	1,514 60			
W. Todd	do	50 00			
R. M. Gibson	do	10 95			
J. Higgins	do	8 00			
O. Anderson	do	11 00			
S. Cook	do	8 75			
J. Crean	do	53 25			
Mrs. Doyle	do	31 35			
Mrs. D. C. Wilkinson	do	26 25			
A. Marquette	do	148 00			
J. Higgins	do	37 25			
J. McCabe	do	30 65			
J. Nixon	do	35 25			
A. Henningsen	do	6 00			
H. Sternson	do	39 68			
			2,999 34		
J. Sharp	To pay for meals supplied immigrants	40 08			
D. Spence	do do	5 50			
F. A. Foley	do do	23 70			
			69 28		
G. & E. Evans	Furnishings	183 27			
Gurney & Co	do	16 05			
			199 32		
W. Knifton	Services at Immigration Sheds	3 0 00			
do	To pay assistants do	214 00			
J. Saunders	Services do	18 00			
T. J. Muir	do do	404 25			
	Carried forward	936 25	6,610 13	37,031 24	1,561,091 69

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	936 25	6,610 13	37,031 24	1,561,091 69
	PROVISIONS, MEDICAL ATTENDANCE, &c.—*Continued*				
W. Lawton	Services at Immigration Sheds	12 00			
S. G. Best	Travelling expenses	9 00			
			957 25		
P. Burns	Fuel	106 50			
T. McConnell & Co	do	129 44			
H. B. Rathbun & Son	do	272 65			
			508 59		
J. H. Richardson	Medical attendance	300 00			
Dr. A. Wolverton	do	95 50			
J. H. Hutty	Medicines	4 30			
N. C. Love	do	37 98			
			437 78		
				8,513 75	
	EXPENSES OF PAMPHLETS.				
J. D. Cew	Services collecting statistics for pamphlets		8 00		
J. C. Lee	do		8 00		
F. Jones	do		4 50		
S. L. Roberts	do		5 00		
J. Roberts	do		2 00		
A. H. Dymond	Services		200 00		
W. A. Hope	Services as clerk		42 00		
H. Monk	Services		5 00		
Sundry newspapers	Advertisements		23 68		
D. Spence	Travelling expenses		62 65		
W. Warwick & Son	Binding		2,755 07		
C. B. Robinson	Printing		857 89		
Burland Lithographing Co	do		225 00		
J. Notman	Paper		1,449 25		
Rolph, Smith & Co	Maps, etc.		840 00		
Rowsell & Hutchinson	Electrotype		2 50		
Express Co	Charges		7 20		
				6,497 74	

	INCIDENTALS.				
Montreal Telegraph Co	Telegrams	158 48			
Dominion Telegraph Co	do	42 38			
E. Sirnitt	Postage, telegrams, etc	0 36			
Joseph Sharp	do do	3 75			
J. Ritchie	do do	145 59			
W. E. Hamilton	do do	14 28			
			364 84		
C. B. Robinson	Printing	64 43			
W. Warwick & Son	Binding	16 01			
Dawson & Co	Stationery	24 38			
			104 82		
Nolan & Murphy	Interments	15 00			
City of Kingston	do	14 75			
			29 75		
J. H. Samo	Furniture	2 87			
F. O. Vallerand & Co	Furnishings	6 15			
R. Walker & Son	Carpeting	38 78			
M. Hurley	Painting	27 20			
H. S. Scott	Hardware	4 95			
Rice Lewis & Son	do	12 00			
G. & E. Evans	Tinsmithing	45 65			
			137 60		
Might & Taylor	Directory	2 50			
T. Bennot	Maps	4 38			
Willing & Williamson	do	4 50			
			11 38		
W. Anderson, Jr	Services Quebec office	40 00			
D. O'Leary	On account of board	10 00			
S. Peters	Carpentering	4 50			
F. A. Foley	do	11 17			
Sundry newspapers	Subscriptions and advertising	175 45			
Madam DeKoerber	Travelling expenses	28 20			
D. Spence	To pay sundries	21 75			
			291 07		
				939 46	
	Total Immigration				52,982 19
	AGRICULTURE, ARTS, LITERARY AND SCIENTIFIC INSTITUTIONS.				
	AGRICULTURE.				
The Treasurer, Agricultural Society—	Legislative Grant				
Addington	do	700 00			
	Carried forward	3,500 00			1,614,073 88

AGRICULTURE, ARTS, LITERARY AND SCIENTIFIC INSTITUTIONS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	3,500 00			1,614,073 88
	AGRICULTURE.—*Continued.*				
The Treasurer, Agricultural Society—					
Algoma	Legislative Grant	700 00			
Brockville	do	700 00			
Brant, South	do	700 00			
Brant, North	do	709 00			
Bruce, South	do	700 00			
Bruce, North	do	700 00			
Carleton	do	700 00			
Cornwall	do	350 00			
Cardwell	do	700 00			
Dufferin	do	700 00			
Dundas	do	700 00			
Durham, West	do	700 00			
Durham, East	do	700 00			
Dysart, Monmouth, etc.	do	150 00			
Elgin, East	do	700 00			
Elgin, West	do	700 00			
Essex, North	do	700 00			
Essex, South	do	700 00			
Frontenac	do	700 00			
Grey, East	do	700 00			
Grey, South	do	700 00			
Grey, North	do	700 00			
Glengarry	do	700 00			
Grenville	do	700 00			
Huron, East	do	700 00			
Huron, West	do	700 00			
Hastings, East	do	700 00			
Hastings, West	do	700 00			
Hastings, North	do	648 00			
Huron, South	do	700 00			
Haldimand	do	700 00			
Hamilton	do	350 00			
Halton	do	700 00			
Kent, East	do	700 00			
Kent, West	do	700 00			
Kingston	do	350 00			

London	do		350 00			
Lanark, North	do		700 00			
Lanark, South	do		700 00			
Leeds and Grenville	do		700 00			
Leeds, South	do		700 00			
Lincoln	do		700 00			
Lambton, East	do		700 00			
Lennox	do		700 00			
Lambton, West	do		700 00			
Middlesex, North	do		700 00			
Middlesex, West	do		700 00			
Middlesex, East	do		700 00			
Muskoka	do		700 00			
Monk	do		700 00			
Niagara	do		350 00			
Norfolk, South	do		700 00			
Norfolk, North	do		700 00			
Northumberland, East	do		700 00			
Northumberland, West	do		700 00			
Ottawa	do		350 00			
Oxford, North	do		700 00			
Oxford, South	do		700 00			
Ontario, North	do		700 00			
Ontario, South	do		700 00			
Prescott	do		700 00			
Perth, North	do		700 00			
Perth, South	do		700 00			
Prince Edward	do		700 00			
Peel	do		700 00			
Peterboro', East	do		700 00			
Peterboro', West	do		700 00			
Renfrew, North	do		700 00			
Renfrew, South	do		700 00			
Russell	do		700 00			
Simcoe, South	do		700 00			
Simcoe, East	do		700 00			
Simcoe, West	do		700 00			
Stormont	do		700 00			
Six Nation Indians	do		50 00			
Toronto	do		550 00			
Victoria, North	do		700 00			
Victoria, South	do		700 00			
Waterloo, North	do		700 00			
Waterloo, South	do		700 00			
Wentworth, North	do		700 00			
Wentworth, South	do		700 00			
Welland	do		700 00			
Wellington, Centre	do		700 00			
Wellington, West	do		700 00			
		Carried forward	56,698 00			1,614,073 88

AGRICULTURE, ARTS, LITERARY AND SCIENTIFIC INSTITUTIONS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	56,698 00			1,614,073 88
	AGRICULTURE.—*Continued.*				
The Treasurer, Agricultural Society—					
Wellington, South	Legislative Grant	700 00			
York, North	do	700 00			
York, East	do	700 00			
York, West	do	700 00			
Western Dairymen's Association	do		59,498 00		
Eastern Dairymen's Association	do		1,500 00		
Agricultural and Arts Association of Ontario	do		1,500 00		
Entomological Society	do		10,000 00		
Fruit Growers' Associat'n	do		1,000 00		
Poultry Association	do		1,800 00		
			700 00		
				75,998 00	
The Treasurer Mechanics' Institute—	MECHANICS' INSTITUTES.				
Ailsa Craig	Legislative Grant	200 00			
Aylmer	do	300 00			
Arkona	do	400 00			
Brantford	do	400 00			
Brockville	do	400 00			
Belleville	do	400 00			
Bradford	do	400 00			
Barrie	do	400 00			
Brussels	do	400 00			
Blyth	do	100 00			
Bowmanville	do	100 00			
Chatham	do	300 00			
Clifton	do	400 00			
Collingwood	do	400 00			
Clinton	do	150 00			
Claude	do	400 00			
Dundas	do	80 00			
Durham	do	400 00			
Elora	do	120 00			
Ennotville	do	400 00			
	do	80 00			

Grimsby	do		140 00				
Garden Island	do		400 00				
Guelph	do		400 00				
Galt	do		400 00				
Goderich	do		400 00				
Harriston	do		100 00				
Hamilton	do		400 00				
Ingersoll	do		400 00				
Kingston	do		400 00				
London	do		400 00				
Lindsay	do		400 00				
Mitchell	do		100 00				
Markham	do		400 00				
Mount Forest	do		200 00				
Milton	do		150 00				
Meaford	do		400 00				
Napanee	do		100 00				
Norwich	do		200 00				
Niagara	do		100 00				
Norwood	do		270 00				
Oakville	do		400 00				
Orillia	do		400 00				
Petrolia	do		400 00				
Paris	do		400 00				
Preston	do		400 00				
Point Edward	do		400 00				
Peterboro	do		200 00				
Prescott	do		100 00				
Paisley	do		400 00				
Ridgetown	do		400 00				
St. Mary	do		400 00				
Strathroy	do		400 00				
St. Catharines	do		400 00				
Sarnia	do		400 00				
St. George	do		400 00				
St. Thomas	do		210 00				
Stouffville	do		400 00				
Seaforth	do		400 00				
Toronto	do		400 00				
Thorold	do		400 00				
Uxbridge	do		400 00				
Watford	do		100 00				
Welland	do		210 00				
Waterloo	do		200 00				
Wardsville	do		100 00				
Whitby	do		400 00				
Woodstock	do		170 00				
Wroxeter	do				20,880 00		
					20,880 00	75,998 00	1,614,073 88

Carried forward ....

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		20,880 00	75,998 00	1,614,073 88
	MECHANICS' INSTITUTES.—*Continued.*				
The Treasurer Ontario Society of Artists	Legislative Grant		5,000 00		
School of Art and Design, Toronto	do		500 00		
School of Art and Design, London	do		500 00		
				26,880 00	
	LITERARY INSTITUTIONS.				
Canadian Institute, Toronto	Legislative Grant		750 00		
Canadian Institute, Ottawa	do		300 00		
Literary and Scientific Society, Ottawa	do		300 00		
				1,350 00	
	MISCELLANEOUS.				
S. P. May	Travelling expenses *re* Mechanics' Institutes		895 50		
L. W. Ord	do do		8 00		
Rolph, Smith & Co	Engraving		142 20		
W. Warwick & Son	Binding		603 05		
C. B. Robinson	Printing		524 54		
J. Notman	Paper		631 73		
H. E. Clark & Co	Satchel		6 60		
Willing & Williamson	Prize books		20 00		
J. B. Aylsworth	Inspecting Loughboro' Agricultural Society		7 00		
A. Piddington	Post cards		31 25		
D. Stirton	Postages, etc		51 08		
W. Rennie	Seeds		9 75		
Meehan, T	do		7 50		
G. Leslie & Son	Travelling expenses		21 25		
T. Beall	do		17 45		
D. W. Beadle	do		14 00		
P. C. Dempsey	do		19 35		

E. G. Allan	Specifications		36 07		
G. W. Buckland	To pay sundries		9 05		
				3,054 72	
	Total Agriculture, Arts, Literary and Scientific Institutions				107,282 72

HOSPITALS AND CHARITIES.

The Treasurers—					
General Hospital, Toronto	Legislative Grant			18,240 61	
City Hospital, Hamilton	do			4,819 58	
General do Kingston	do			3,379 76	
Hotel Dieu Hospital, Kingston	do			2,496 50	
General Protestant Hospital, Ottawa	do			2,737 41	
Roman Catholic Hospital, Ottawa	do			3,801 40	
Gen'l Hospital, London	do			3,303 92	
General Marine Hospital, St. Catharines	do			2,364 85	
General Hospital, Guelph	do			1,807 36	
St. Joseph's Hospital, Guelph	do			1,163 40	
General Hospital, Pembroke	do			400 00	
House of Industry, Toronto	do			2,188 55	
House of Providence, Toronto	do			4,617 83	
Home for Incurables, Toronto	do			417 27	
House of Refuge, Hamilton	do			1,082 88	
Home for Aged Women, Hamilton	do			443 66	
House of Industry, Kingston	do			988 42	
House of Providence, Kingston	do			1,454 67	
Home for Aged and Friendless, London	do			670 60	
	Carried forward			56,578 64	1,721,356 60

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	.....	.....	56,378 64	1,721,356 60
	HOSPITALS AND CHARITIES.—*Continued.*				
Roman Catholic Orphan Association, London ..	Legislative Grant..	....	....	653 10	
St. Patrick's House of Refuge, Ottawa.....	do	....	.....	819 66	
St. Charles Hospice, Ottawa.....	do	....	.. ..	1,205 52	
House of Providence, Guelph.....	do	.....	... .	962 71	
Protestant Home, St. Catharines	do	....	....	88 90	
The Home, St. Thomas.	do	....	.....	267 66	
St. Vincent Home, Hamilton	do	....	.....	400 00	
Roman Catholic Orphan Association, Toronto .	do	.....	.....	1,764 72	
Orphans' Home, and Female Aid Society Toronto	do	.....	... .	729 54	
Girls' Home, Toronto...	do	....	....	874 72	
Boys' do do	do	....	....	588 18	
Newsboys' Lodgings, Toronto.....	do	.....	.....	111 58	
Infants' Home, Toronto.	do	.....	.....	618 08	
St. Nicholas' Home, do	do	.....	.....	176 10	
St. Mary's Orphan Ass., Hamilton	do	....	....	778 14	
Orphan Asylum, Hamilton	do	....	.....	167 98	
Boys' Home, Hamilton .	do	.....	....	509 58	
Girls' do	do	.....	.....	440 32	
Orphans' Home, Kingston.....	do	....	.....	367 60	
House of Providence Orphan Asylum, Kingston	do	.....	.....	368 62	
Hotel Dieu Orphan Association, Kingston	do	.....	.....	329 46	
Orphans' Home, Ottawa.	do	....	.....	275 72	

St. Patrick's Orphan Asylum, Ottawa	do			330 72	
St. Joseph's Orphan Asylum, Ottawa	do			501 86	
Roman Catholic Orphan Asylum, London	do			629 54	
Prot'st'nt Orphans' Home London	do			428 24	
St. Catharine's Home, St. Catharines	do			157 70	
St. Agatha Orphan Asylum, St. Agatha	do			179 04	
Orphan Asylum, Fort William	do			200 00	
Magdalen Asylum, Toronto	do			248 48	
Good Shepherd Refuge for Fallen Women, Toronto	do			142 64	
Home for the Friendless, Hamilton	do			137 74	
Good Shepherd Magdalen Hospital, Ottawa	do			799 62	
Women's Christian Association, London	do			170 52	
	Total Hospitals and Charities				72,832 63

MISCELLANEOUS.

EXPENSES RE LAW STAMPS AND LICENSES.

C. B. Robinson	Printing	388 06		
W. Warwick & Son	Binding	193 44		
			581 50	
H. Totten	Travelling expenses	35 40		
F. Yeigh	Services, and travelling expenses	53 25		
G. G. Laird	Services as extra clerk, and inspecting	148 55		
W. W. Jefers	do do	120 00		
J. B. McDonald	do do	122 00		
			479 20	
Express Co	Charges		4 80	
			1,065 50	
	Less refunds by license districts *re* printing and binding		588 36	
				477 14
	Carried forward			477 14 1,794,189 23

MISCELLANEOUS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward			477 14	1,794,189 23
	ONTARIO MANUFACTURES.				
J. Korman	Grant to establish markets in Europe for manufactures			3,000 00	
	RELIEF OF DISTRESS IN IRELAND.				
Manager Bank of British North America	Legislative grant			20,000 00	
	MARRIAGE LICENSES.				
William Warwick & Son	Binding		116 75		
H. C. Dixon	Postage stamps		50 00		
				166 75	
	ONTARIO RIFLE ASSOCIATION.				
W. N. Alger,	Legislative grant			600 00	
	INSURANCE PUBLIC BUILDINGS.				
Canadian Steam Users' Insurance Co	Premiums on Insurance Policies		598 53		
Hartford Insurance Co	do		405 25		
Phœnix do	do		336 50		
Ætna do	do		336 50		
Royal Canadian do	do		336 50		
Scottish Imperial do	do		327 50		
Dominion do	do		10 00		
Guardian Assurance do	do		10 00		
Imperial Insurance do	do		10 00		
Northern Assurance do	do		10 00		
Norwich Union Ins. do	do		10 00		
Quebec Assurance do	do		10 00		
Queen's Insurance do	do		19 00		

British American Ins.	do		9 00	
Western	do		9 00	
London Assurance	do		9 00	
Sovereign Insurance	do		9 00	
Commercial Union	do		9 00	
North British and Mercantile	do		9 00	
Lancashire Insurance Co	do		9 00	
Liverpool, London & Globe	do		18 00	
Citizens' Insurance Co	do		9 00	
Canada Fire & Marine	do		9 00	
Mercantile Fire Insurance Co	do		3 00	
Union Fire	do		3 00	
W. T. O'Reilly	do		3 00	
	Travelling expenses		9 50	
				2,528 28

EXPENSES OF ELECTIONS.

A. McLaren	Expenses of Election, Cardwell	6 32		
T. D. McConkey	do Dufferin	595 09		
T. Deasy	do Hastings, E	5 00		
W. Ponton	do do W	312 25		
J. H. Perry	do Ontario, N	38 90		
D. E. McIntyre	do Stormont	368 78		
			1,326 34	
C. B. Robinson	Printing	20 20		
W. Warwick & Son	Binding	44 20		
			64 40	
Express Co	Charges	9 68		
H. C. Dixon	Postage	50 00		
C. H. Thompson	Services *re* Election Papers	176 00		
			235 86	
				1,626 42

EXPENSES OF CONTESTED ELECTIONS.

Hon. J. D. Armour	Services—Dufferin		100 00
Hon. S. H. Blake	do Russell		100 00
Hon. T. Galt	do Hastings		100 00
do	do Wentworth, S		100 00
Hon. T. Moss	do do		100 00
do	do Dufferin		100 00
do	do Russell		100 00
do	do Stormont		100 00
do	do Wentworth		100 00
do	do Norfolk, S		100 00
Sheriff Taylor	do Hastings		50 00
do Deeds	do Norfolk, S		21 70
do A. McKellar	do Wentworth, S		66 00
J. W. Hector	do Registrar—Hastings, W		160 37
C. A. Brough	do do Lincoln		66 40
	Carried forward		1,364 47	28,398 59	1,794,189 23

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		1,364 47	28,398 59	1,794,189 23
	EXPENSES OF CONTESTED ELECTIONS. *Continued.*				
C. C. Robinson	Services—Registrar—Russell		110 93		
do	do do Stormont		55 50		
J. W. Hector	do do Wentworth, S		58 15		
T. J. Parkes	do Reporting Cornwall		106 40		
J. S. Monahan	do do Dufferin		14 50		
T. J. Richardson	do do Russell		18 20		
D. Serviss	do Crier—Hastings		4 20		
				1,732 35	
	REVISION OF VOTERS' LISTS.				
His Honour—					
Judge Jones	Travelling expenses, Brant		90 00		
do Kingsmill	do Bruce		36 67		
do Hughes	do Elgin		38 80		
do Price	do Frontenac		69 40		
do McPherson	do Grey		9 50		
do Squier	do Huron		63 51		
do Toms	do do		81 50		
do Mills	do Halton		45 00		
do Stevenson	do Haldimand		4 95		
do Wilkinson	do Lennox and Addington		32 00		
do Clark	do do		36 50		
do Senkler	do Lincoln		75 75		
do Elliott	do Middlesex		13 00		
do Davis	do do		5 00		
do Wilkinson	do Northumberland and Durham		24 00		
do McMahon	do Norfolk		96 00		
do Dartnell	do Ontario		152 00		
do Burnham	do do		80 00		
do McQueen	do Oxford		21 40		
do Scott	do Peel		15 00		
do Dennistoun	do Peterboro		25 00		
do Deacon	do Renfrew		2 31		
do Pringle	do Stormont, Dundas and Glengarry		25 68		
do Gowan	do Simcoe		160 00		
do McDonald	do Welland		37 00		

do Chadwick	do	do		7 50		
do Sinclair	do	Wentworth		176 50		
do Boyd	do	York		34 00		
					1,458 00	
		GRATUITIES.				
Rev. Dr. Ryerson	Legislative Grant—retiring allowance, 1880			4,000 00		
W. J. Palmer	Allowance on retiring from position	Principal Deaf and Dumb Institute	1,000 00			
I. R. Eckart	do	Assistant Secretary	1,733 29			
J. C. Tarbutt	do	Chief Clerk Land Sales Branch C.L.D	6,500 00			
T. Devine	do	Deputy Surveyor General, C. L. D	5,666 00			
W. Ford	do	Accountant, C.L.D	4,666 00			
J. Innis	do	Clerk Surveys and Patents Branch, C.L.D	2,658 00			
W. M. Kelly	do	Warden Provincial Reformatory	4,115 00			
W. R. Riddell	do	Mathematical Master, N.S., Ottawa	125 00			
D. McArthur	do	Writing Master, N.S., Ottawa	25 00			
W. J. S. Holwell	do	Draughtsman, P.W.D	500 00			
R. J. Wallbridge	do	Teacher, Deaf and Dumb Institute	125 00			
D. Grant	do	Carpenter, Departmental Buildings	537 66			
H. Crebor	do	do D. & D. Institute	412 47			
W. Flyn	do	Assistant Gardener, L.A	420 00			
W. Craig	do	Foreman, Provincial Reformatory	182 50			
J. M. Skilley	do	School Master, do	208 30			
M. Mann	do	Tailor, Toronto Asylum	716 59			
P. Maguire	do	Guard, Provincial Reformatory	405 00			
A. Chapman	do	Carpenter, London Asylum	374 94			
R. J. Parker	do	Guard, Provincial Reformatory	630 00			
A. W. Howe	do	Baker, do	25 00			
M. O'Grady	do	Attendant, Toronto L.A	55 00			
Mrs. J. W. Hetherington	Allowance to family of late J. W. Hetherington, Clerk Registrar General's Department		316 84			
				31,407 59		
					35,407 59	
		AID TO SANITARY JOURNAL.				
Editor, *Sanitary Journal*	Legislative grant				800 00	
		TELEPHONE SERVICE.				
Toronto Telephone Dispatch Co	Rent of Telephones				450 00	
		EXPENSES, REMOVAL OF PATIENTS AND PRISONERS.				
J. W. Langmuir	To pay removal expenses		3,650 00			
S. McLoughlin	Account services as bailiff		1,004 96			
	Carried forward		4,654 96		68,246 53	1,794,189 23

MISCELLANEOUS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	4,654 96		68,246 53	1,794,189 28
	EXPENSES, REMOVAL OF PATIENTS AND PRISONERS.—*Continued.*				
J. Waddell	Account, services as bailiff	642 00			
J. English	do do	17 40			
Mrs. E. McLoughlin	do	146 06			
			5,460 42		
W. Warwick & Son	Binding	86 26			
C. B. Robinson	Printing	52 60			
			138 86		
P. Paterson & Son	Handcuffs	23 75			
Petley & Co	Clothing	29 70			
			53 45		
			5,652 73		
	Less refund by counties		3,482 11		
				2,170 62	
	AGRICULTURAL COMMISSION.				
H. C. Dixon	Postage stamps		165 00		
Express Company	Charges		10 00		
Dominion Telegraph Co	Telegrams		0 79		
Montreal Telegraph Co	do		4 73		
C. B. Robinson	Printing		377 00		
Wm. Warwick & Son	Binding		90 28		
Rolph, Smith & Co	Printing map		10 00		
Pim & Holt	Printograph		7 00		
J. Notman	Stationery		251 39		
A. H. Dymond	Services as Secretary		2,000 00		
R. Humphrey	Services as Clerk		299 99		
E. Byrne	Services and expenses		138 77		
George Eyvel	Reporting		694 41		
A. Horton	do		568 10		
D. H. Monk	Services re preparation of map		50 00		
G. Verral	Cab-hire		0 50		
J. P. Wiser, M.P	Travelling expenses		147 17		
J. B. Aylesworth	do		57 00		

Wm. Brown	Travelling expenses		28 50		
John Watson	do		29 60		
A. Wilson	do		58 40		
J. Dryden	do		9 00		
W. Saunders	do		18 60		
E. H. Hilborn	do		50 76		
John McMillan	do		61 32		
Wm. Whitcher	do		36 00		
R. Gibson	do		42 76		
F. Malcolm	do		66 80		
E. Stock	do		13 20		
A. H. Dymond	do		1,125 73		
Hon. S. C. Wood	do		10 00		
Dr. Beadle	do		10 80		
W. Saunders	do		24 60		
P. C. Dempsey	do		18 52		
Thomas Beall	do		15 00		
C. Arnold	do		11 60		
B. E. Bucke	do		34 40		
J. Clay	do		11 60		
J. J. Hobson	do		10 24		
J. Miller	do		8 40		
P. R. McMonagh	do		32 68		
D. A. Jones	do		11 04		
C. Drury	do		11 60		
C. A. Wetherson	do		31 84		
J. Dickson	do		23 04		
E. B. Morgan	do		5 64		
D. M. McPherson	do		35 44		
J. Ingles	do		49 50		
Wilson	do		35 20		
T. Ballantyne	do		32 40		
W. T. Benson	do		24 40		
A. Broder	do		29 56		
				6,890 30	
	NORTH-WEST BOUNDARY.				
F. Devlin	Cab-hire		1 25		
Thomas Hodgins	Revising arguments *re* Boundary		175 00		
J. P. Macdonnell	Services as Clerk		200 00		
				376 25	
	UNPROVIDED ITEMS.				
	SUPPLIES FOR DISTRESSED SETTLERS—ALGOMA DISTRICT, Etc.				
Joseph Wilson	Supplies	117 11			
A. G. Judd	do	1,150 00			
D. M. Card	do	1,500 00			
	Carried forward	2,767 11		77,683 70	1,794,189 23

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward ...	2,767 11	.....	77,683 70	1,794,189 23
	SUPPLIES FOR DISTRESSED SETTLERS—ALGOMA DISTRICT, ETC.—*Continued.*				
R. H. Ramsay & Co	Supplies	153 30			
A. J. Button	do	2,000 00			
D. Purcell	do	54 59			
A. J. O'Neill	do	100 00			
S. Parish	do	2,439 15			
E. J. McDougall	do	11 40			
E. Sirrett	Cartage of Supplies	21 35			
Dill & Kirk	Supplies	63 25			
W. Ryan	do	1,703 70			
McMaster, McClung & Co	do	136 00			
			9,449 85		
	SURPLUS DISTRIBUTION.				
H. C. Dixon	Postage stamps	25 00			
L. W. Ord	Travelling expenses	83 00			
			108 00		
	MUNICIPALITIES AND OTHER FUNDS.				
C. B. Robinson	Printing	15 65			
R. V. Lauder	Services as Clerk	48 00			
W. N. Douglass	do	143 32			
H. C. Dixon	Postage stamps	75 00			
			281 97		
	ALGOMA TAXES.				
R. V. Lauder	Services as Clerk	110 00			
J. Mann	do	450 00			
			560 00		

	SUNDRY ITEMS.				
Rolph, Smith & Co	Altering Railway Certificates	465 00			
Rolph, Smith & Co	Licenses Insurance Companies	60 00			
			525 00		
Hunter, Rose & Co	Stereotyping Statutes	688 50			
W. Elliott	Painting *re* Governor General's visit	21 15			
C. B. Robinson	Printing *re* Building Societies	66 45			
Express Co.	Charges *re* International Park	2 30			
Hon. S. C. Wood	Travelling expenses *re* arbitration	18 00			
Manager Ontario Bank	Costs Attorney-General, *Contois et al*	1,832 37			
E. E. Horton	Reporting *re* McMahon Commission	32 90			
T. Hodgins	Services *re* McGrath vs. Inspector of Prisons	23 00			
			2,484 67		
				13,609 49	
	Total Miscellaneous				91,293 19
	PUBLIC BUILDINGS.				
	ASYLUM FOR INSANE, TORONTO.				
Treasurer City Toronto	Share of construction of drain	4,000 00			
O. Mead	Painting	182 60			
			4,182 60		
	FURNITURE, FURNISHINGS, ETC.				
Toronto Lime Co	Cement	52 00			
E. Terry	Cement	22 50			
L. Brinnan & Co	Sand and Stone	120 07			
C. P. Industries	Door frames	217 60			
D. S. Keith & Co	Plumbing, etc	52 00			
W. L. Wells	Carpentering	193 00			
G. Spinlove	do	22 50			
Provincial Reformatory	Furniture	500 00			
	Carried forward	1,179 67			1,885,482 42

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	1,179 67	4,182 60		1,885,482 42
	ASYLUM FOR INSANE, TORONTO.—*Continued.*				
A. L. Underwood	Lumber	262 00			
Hughes Bros	Carpeting	706 48			
R. Hay & Co	Furniture	2,685 20			
J. Reid	do	13 97			
Petley & Co	Carpeting	691 82			
Hunter & Co	Chromos and Photos	143 50			
Sundry newspapers	Advertisements	30 00			
			5,712 64		
				9,895 24	
	ASYLUM FOR THE INSANE, LONDON.				
A. Purdom	On account contract	1,027 00			
Gutta-Percha R. Co	Rubber-hose	629 53			
Sundry persons	Work on grounds	300 00			
R. McCallum	Travelling Expenses	13 90			
R. Purdom	do	6 00			
R. P. Fairbairn	do	9 00			
F. P. O'Calaghan	Services and expenses	8 75			
Sundry newspapers	Advertisements	12 00			
			2,006 18		
	FURNITURE, FURNISHINGS, ETC.				
Hunter & Co.	Chromos and photos	101 50			
J. J. Anderson & Co	Books	165 69			
C. Chapman	Binding	31 50			
Collector of Customs	Duties	6 05			
G. W. Railway	Freight	1 77			
H. C. Green	Lumber	154 93			
J. Cowan	Hardware	16 50			
B. Greening & Co.	Wire-guards	94 45			
McClary Manufacturing Co.	Furnishings	7 52			
E. Baines & Co	Paints	417 83			
Stephens, Turner & Burns	Castings	163 36			
R. Lewis	Wallpaper	38 45			

W. J. Reid & Co.	Crockery, etc	316 42			
L. G. Joliffe	Chandelier	32 00			
R. S. Murray & Co.	Carpeting	448 54			
J. B. Laing & Co	do	42 50			
Singer Manufacturing Co.	Sewing-machine	36 00			
W. Hinton	Furniture	162 25			
J. Ferguson	do	589 00			
R. Hay & Co.	do	68 50			
W. Bryce	Furnishings	15 00			
Bowman & Co	Drain tiles	128 00			
S. Stewart	Stove, etc	48 90			
O. B. Graves	Wallpaper	31 88			
A. S. Murray	Clock	4 00			
Bennet School Furniture Co.	Furniture	126 50			
J. L. Mott	Ironware	23 60			
J. D. Hardy	Plastering	12 00			
A. D. Cameron	Lime	14 40			
Ponty & Taylor	Trees	118 75			
P. Fallon	Gravel	280 50			
B. M. Mathews	Horse	75 00			
J. Langford	do	61 00			
R. Mason	Moving sheds	74 00			
J. Campbell	Repairing waggon	30 00			
G. B. Gnest	do harness	30 00			
A. Purdom	do guards	98 59			
Sundry Newspapers	Advertisements	19 70			
			3,988 98		
				5,995 16	
	ASYLUM FOR THE INSANE, HAMILTON.				
D. S. Keith & Co.	Plumbing	110 00			
McPhie & Farmer	do	253 27			
G. C. Morrison	do	93 53			
A. J. Brown	On account of contract	6,113 31			
E. Vanallen	Balance of Contract	50 00			
Olmstead & Son	Furnishings	62 00			
Gutta Percha Manf'g Co.	Rubber hose, etc	629 53			
W. Campbell & Son	Sewer pipes	182 70			
Wood & Leggat	Hardware	13 45			
B. Lewis & Son	Lumber	223 49			
Furniss & Son	Stone	5 00			
J. Lee	Brick, etc	15 60			
W. Sullivan	Work on drain, etc	213 17			
R. Purdom	Travelling expenses	14 00			
K. Tully	do	21 00			
F. P. O'Callaghan	do	16 30			
Sundry Newspapers	Advertising	16 20			
			8,032 55		
	Carried forward		8,032 55	15,890 40	1,885,482 42

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PUBLIC BUILDINGS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	.....	8,032 55	15,890 40	1,885,482 42
	ASYLUM FOR THE INSANE, HAMILTON.—*Continued.*				
	FURNITURE, FURNISHINGS, ETC.				
J. Reid	Furniture	21 00			
Provincial Reformatory	do	438 08			
J. Hoodless	do	167 54			
Robert Hay & Co	do	380 38			
R. Brierly & Co	do	110 20			
J. Reid & Co	do	31 88			
J. Reid & Co	do	10 00			
Thomas Lees	do	7 80			
A. Duncan & Co	do	10 65			
J. M. Williams & Co	Furnishings	69 95			
B. Greening & Co	do	5 00			
D. S. Keith & Co	do	6 00			
R. Duncan & Co	do	20 00			
E. Baines & Co	Paints	148 03			
W. Farmer	Castings	13 30			
Achison & Co	Lumber	8 46			
B. Lewis & Co	do	316 50			
Hunter & Co	Chromos and photos	167 75			
D. Eckerson & Co	Photos	17 50			
T. B. Frank	Surveying	10 00			
A. Duncan & Co	Dry goods	681 26			
Bryce, McMurrich & Co	Bedding	88 00			
A. Hamilton	Painting	116 37			
J. Philp	Harness	25 00			
C. B. Snow	Phaeton	125 00			
W. & D. Grant	Horses	289 50			
H. S. Cooper	Sleigh	35 00			
J. A. Bruce & Co	Garden implements	18 50			
Stone & Wellington	Trees and shrubs	200 45			
T. Forfar	Garden implements	5 00			
T. Wilson	Repairs to furniture	86 40			
Times Printing Co	Advertising	19 00			
J. M. Wallace	Travelling expenses	10 70			
			3,600 00		
				11,632 55	

KINGSTON ASYLUM.

McGrath	Account contract	2,874 00			
J. Neil & Sons	Water-pipes	200 50			
Neil McNee	Plumbing, etc.	265 58			
J. McGrath	Pointing	140 25			
Toronto, Grey & Bruce Ry.	Wharfage and freight	41 70			
K. Tully	Travelling expenses	24 50			
R. Purdon	do	5 00			
R. Gage	Services as clerk of works	346 50			
B. M. Britton	do *repurchase* of land	324 46			
Sundry newspapers	Advertising	25 50			
			4,247 99		

Furniture and Furnishings, Etc.

R. Brierley & Co	Furniture	6 38			
R. Hay & Co.	do	1,379 00			
H. Brame		1,305 52			
Chown & Cunningham	Field-roller	27 00			
Hunter & Co.	Chromos and photos	126 20			
W. L. Richardson	Repairing pictures	7 80			
Rev'd C. Cartwright	Cow	35 00			
S. Clyde	do	30 00			
Estate of J. Cunningham	Horses	153 00			
Wm. Kendall	do	30 00			
B. McConnell	do	70 00			
G. W. Robinson	Waggon, etc.	79 00			
J. McBow	Trees	22 00			
Sundry newspapers	Advertisements	42 56			
H. B. Rathbun & Son	Lumber	587 25			
			3,900 71		
				8,148 70	

ORILLIA ASYLUM.

R. Stratton	Painting	3 25			
R. Mainer	Galvinized iron	3 50			
J. W. Stevens	Paints	62 25			
P. Bertram & Co.	Hardware	12 72			
Robert Thompson	Lumber	66 60			
R. R. Weir	do	25 66			
J. Bailey	do	20 05			
J. Tait	do	11 93			
P. Madden	do	18 30			
W. Bingham	do	48 05			
	Carried forward	272 31		35,671 65	1,885,482 42

PUBLIC BUILDINGS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	272 31		35,671 65	1,885,482 42
	ORILLIA ASYLUM.—*Continued.*				
G. E. Corbould	Law expenses *re* purchase of land	24 85			
J. G. Scott	To pay do do	5 65			
Brown & Wells	Services *re* title asylum property	5 00			
T. D. McConkey	do do do	2 13			
A. Oliver	Account purchase of land for asylum	1,531 32			
Clark Gamble	do do do	313 68			
Registrar County Simcoe	Fees *re* conveyance lands	3 91			
S. G. O'Grady	Travelling expenses	17 30			
P. O'Callaghan	do	9 10			
R. Stratton	Services as carpenter	49 00			
G. S. Yule	do	39 45			
T. Cremar	do	34 20			
A. McKay	do	25 50			
R. Stewart	do	28 87			
W. McLeod	Services as painter	15 75			
G. Gallagher	do	6 25			
T. Morton	do	15 75			
A. Morris	do	6 25			
E. Smallcomb	do	3 13			
			2,439 40		
	FURNITURE, FURNISHINGS, ETC.				
Provincial Reformatory	Furniture	9 50			
Hunter & Co	Chromos, Photos, etc.	77 50			
S. Philips	Lamps	9 00			
A. Tait	Lumber	49 30			
P. Bertram & Co	Hardware	11 70			
J. Murphy	Gravel	21 01			
J. Harvie	do	6 00			
J. Millard	do	6 00			
R. Stratton	Carpentering	126 00			
			316 00		
				2,755 40	

PROVINCIAL REFORMATORY.

A. J. Brown	Account Contract	12,050 00			
J. Neill & Sons	Ventilators	23 00			
N. & N. W. Railway Co	Freight	1 84			
Sundry newspapers	Advertising	46 80			
R. Purdom	Travelling expenses	44 25			
K. Tully	do	18 00			
B. O. Byrne	Services Clerk of Works	735 00			
			12,918 89		

Furniture, Furnishings, Etc.

Nerlich & Co	Furnishings	10 90			
Rogers Manufacturing Co	do	2 00			
J. Robinson & Co	do	4 00			
Patton & Co	Glassware	10 38			
N. L. Piper & Son	Chandeliers	22 60			
E. C. Gurney & Co	Furnishing, etc	178 09			
G. Harrison	do	36 90			
W. M. Keily	do	500 00			
Hughes Bros	Table furnishings	35 50			
Wheeler & Bain	Lamps, etc	24 45			
R. Wilkes	Clock	11 25			
R. Hay & Co	Furniture	363 02			
Munderloh & Co	Clocks	32 50			
C. Potter	Thermometer	3 50			
William Rennie	Lawn-mower	8 18			
C. J. Whitehead	Stoves, etc	98 50			
W. H. Rice	Window-guards	7 20			
E. Beck & Co	Lumber, fuel, etc	1,056 46			
H. A. Nelson & Son	Furnishings	22 20			
Buntin Bros. & Co	Paper	3 00			
D. Davidson	Lumber	1,363 38			
Edgar & Hallen	do	40 68			
Stephens, Turner & Brown	Hancock Inspirator, etc	62 16			
G. H. Wright	Tinsmithing, etc	148 13			
R. Pearson	Bricklaying	875 44			
B. Revill	Plastering	197 63			
Lauder & Thornton Mf'g. Co.	Plumbing	4 90			
W. J. McGuire	do	37 95			
D. S. Keith & Co	Plumbing	21 35			
J. G. Tait	do	293 45			
J. Greer	Carpentering	308 60			
A. & S. Nordheimer	Musical instruments	16 95			
M. O'Donoghue	Services as Carpenter	105 60			
John McIntosh	do	135 60			
F. Corbeau	do	151 20			
P. McLaughlin	do	111 45			
	Carried forward	6,303 30	12,918 89	38,427 05	1,885,482 42

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	6,303 30	12,918 89	38,427 05	1,885,482 42
	PROVINCIAL REFORMATORY.—*Continued.*				
	FURNITURE, FURNISHINGS, ETC.—*Continued.*				
W. Clark	Services as Carpenter	90 25			
J. Neill & Son	Machinery	286 77			
T. R. Fuller	do	55 00			
W. Buck	do	78 00			
Ridout, Aird & Co	Machinery, cement, etc	604 77			
Rice Lewis & Son	Belting, etc	149 84			
P. Paterson & Son	Hardware	825 11			
Central Prison Industries	Mats	36 54			
Wheeler & Wilson	Sewing machines	38 50			
Singer Manufacturing Co	Shuttles	1 50			
W. Hewitt & Co	Hardware	120 62			
Munday & Shannahan	do	111 63			
J. Robertson & Co	Saws	45 62			
Waterous Engine Co	Machinery	30 33			
K. Stewart Mg. Co	Type and stamps	6 00			
C. A. Scadding	do	3 60			
W. Rennie	Garden implements	4 39			
C. Howard	Mill files	10 36			
Wood & Leggat	Wheelbarrows	18 00			
W. J. Maguire	Pump	4 50			
J. S. Johnston	Lime, etc	100 95			
Elliot & Co	Varnish	5 30			
C. G. Gurdron	Plaster	17 50			
G. Duthie	Slate	26 05			
J. Wright	Brick	4 80			
E. Baines & Co	Paints	249 36			
H. S. Howland & Co	Lead	36 90			
A. Bourke	Lime-kiln	15 00			
Hughes Brothers	Bedding	125 19			
H. E. Jeffery	Wood	52 05			
Cant, Gourlay & Co	Repairing machinery	8 60			
J. Turner & Son	do	10 40			
J. Evans	Sinking well	39 69			
C. Cameron	Sundry repairs	6 40			

T. McCrosson	Sundry payments	100 00		
W. P. Band	To pay freight	21 35		
J. Smith	Freight	458 21		
C. Brown	Cab-hire	2 50		
N. A. Perkins	Horses	150 00		
			10,254 88	
				23,173 77
	MERCER REFORMATORY.			
Hunter & Co.	Chromos and photographs		146 50	
Rowsell & Hutchison	Books		14 80	
Willard Tract Depository	do		8 12	
U. C. Bible Society	do		36 20	
Education Depository	do		72 47	
P. O'Shea	do		17 50	
Provincial Reformatory	Furniture		589 16	
R. Hay & Co.	do		1,583 69	
Petley & Co.	do		414 13	
Central Prison Industries	do		1,924 98	
R. W. Laird	do		19 50	
Mercer Reformatory	Bedding and towels		60 00	
W. Thomson & Co.	Crockery		443 53	
Wheeler & Bain	Furnishings		30 50	
Smith & Fudger	Clocks		70 75	
R. A. Wood	Medical instruments		133 10	
McSpadden & Ritchie	Organ		245 00	
J. D. Edgar & Sons	Soaps		17 00	
Bryce, McMurrich & Co.	Blankets, etc		2,624 07	
Hughes Bros.	Carpets, etc		964 47	
Petley & Co.	do		156 49	
A. R. McMaster & Bro.	Bedding, etc		422 62	
E. P. Rice	Window-blinds		210 00	
Goddard & Callister	Blinds		36 25	
W. J. McGuire & Co	Range, boiler and steam-kettles		1,172 18	
G. Golf	Wash-basins		32 40	
P. Paterson & Son	Hardware		508 91	
C. W. Williams	Sewing-machine		40 00	
A. Craig	Iron-work		24 30	
D. Kennedy	Refrigerator		100 00	
R. L. Cowan	Fire-clay		4 50	
G. & E. Evans	Tinware		72 98	
E. & C. Gurney	Range		50 85	
Singer Manufacturing Co.	Sewing-machines		295 00	
R. M. Wanzer & Co.	do		115 00	
Wheeler & Wilson Manf. Co.	do		40 70	
Blind Institute	Baskets		36 00	
A. Hamilton	Blackboards		5 50	
J. M. Beath	Lumber		10 90	
Fox & Co	do		12 39	
	Carried forward		12,762 47	61,600 82

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		12,762 47	61,000 82	1,885,482 42
	MERCER REFORMATORY.—*Continued.*				
G. & E. Evans	Tinware		20 90		
C. Jones	Stove		17 50		
A. Hamilton	Cutting letters		39 92		
G. Leslie & Son	Trees and shrubs		293 50		
G. Gibson	Planting trees		40 00		
Fox & Co.	Supports for trees		5 00		
J. R. Dunn	Straw		11 79		
J. Costinello	Carpentering		36 00		
M. Dunn	Services		5 30		
H. W. Dillon	do as engineer		211 66		
J. Gibson	do on grounds		162 00		
J. A. McLean	Erecting furnace		50 00		
J. Morgan	Brickwork		6 60		
T. L. Hicks	Locksmithing		7 50		
D. S. Keith & Co.	Plumbing, etc.		143 73		
T. Lalor, jun	Locksmithing		13 50		
R. W. Laird	Cartage, express, etc		13 75		
Northern & N.W. Railway	Freight		54 21		
G. Verral	Cab-hire		16 00		
N. Meehan	Teaming		37 05		
				13,977 78	
	CENTRAL PRISON.				
J. Britton	Furnishings		236 50		
C. W. Williams Mf'g Co	Sewing machines		40 00		
Petley & Co	Carpeting		25 07		
Brock & Kent	Lumber		63 72		
Rice Lewis & Son	Hardware		51 05		
A. L. Underwood	Lumber		355 46		
H. Hewitt & Co	Hardware		42 51		
P. Paterson & Son	do		107 98		
W. J. McGuire & Co	Rubber hose		66 99		

W. Featherstonhaugh	Broom appliances		227 85		
Central Prison Industries.	Carpentering		621 60		
E. & C. Gurney	Castings		46 85		
				1,885 58	
	INSTITUTION FOR DEAF AND DUMB, BELLEVILLE.				
	Hose, etc				
Gutta-Percha M'fg Co	Travelling expenses	171 85			
R. Purdom		5 00			
			176 85		
	FURNITURE AND FURNISHINGS, ETC.				
Flint & Holton	Lumber	146 54			
Northcott & Alford	do	800 25			
John Lewis	Hardware	120 85			
E. Baines & Co	Paints	94 16			
H. A. Nelson & Sons	do	17 29			
C. F. Smith	Paint cans	3 85			
H. B. Rathbun & Son	Plaster	2 00			
L. Prang & Co	Books	12 00			
Education Depository	do	107 70			
Oshawa Cabinet Co	Black-board	13 95			
R. Hay & Co	Furniture	505 50			
Provincial Reformatory	do	260 00			
C. P. Industries	do	36 50			
W. Stahlschmidt	do	171 32			
Bryce, McMurrich & Co	Quilts, etc	312 09			
James Vick	Lawn-mower	100 00			
J. Jones	Trees	49 25			
C. Laing	Planting trees	46 00			
J. Orr	Gravel	85 00			
Waterous Engine Works	Machinery	45 00			
C. F. Smith	Piping, etc	41 00			
J. J. Frost	Shoe findings	35 95			
Elliot & Co	Chemicals	273 84			
R. Templeton	do	36 35			
T. L. McCormack	Sewing machine	45 00			
L. Kester	Knitting machine	40 00			
W. D. Tapp	Swings	24 00			
Gurney & Ware	Scales	15 95			
Sundry persons	Work in grounds	607 26			
Sundry newspapers	Advertising	21 52			
Collector of Customs	Duty	25 25			
G. T. Railway	Freight	61 42			
A. Livingston	To pay sundries	4 52			
			4,161 31		
				4,338 16	
	Carried forward			81,802 34	1,885,482 42

PUBLIC BUILDINGS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward			81,802 34	1,885,482 42
	INSTITUTION FOR THE BLIND, BRANTFORD.				
W. Watt	Lumber		23 81		
J. Bishop	Furnishings		6 21		
W. Watt	Furniture		10 65		
W. Dalrymple	do		87 00		
J. Edgar & Son	Crockery, etc		85 58		
E. L. Goold	Spoons		7 75		
H. W. Brethorn & Co	Carpets, etc		170 60		
W. Grant	Sheeting		82 11		
C. Whitney	Pillows		20 00		
Singer Manufacturing Co	Sewing machines		82 50		
J. S. Morton	Scale and letter press		14 50		
Waterous Engine Works	Hose		107 00		
L. Hewitt & Co	Pianos, organs, etc.		550 00		
W. Denarts	Trees		30 00		
C. Arnold	do		40 90		
D. Jolly	do		181 35		
W. Mitchell	do		4 00		
D. Draper	do		23 25		
W. Buck	do		108 75		
A. Spence	do		54 55		
W. Harrington	Teaming		55 62		
J. Mott	do		57 50		
A. Mott	do		86 25		
Benjamin Draper	Services as labourer		6 00		
				1,895 88	
	SCHOOL OF AGRICULTURE, GUELPH.				
Geo. A. Daniels	Lumber, etc		120 61		
A. J. Brown	On account, contract		12,750 00		
G. Harding	do do		5,100 00		
C. B. Carter	Apparatus, etc		294 14		
Guelph Gas Co	Gas apparatus		2,000 00		

Burr & Skinner	Furniture		224 50		
J. Worsfold & Co	do		210 00		
A. O. Buchan	Blankets		97 35		
G. B. Fraser	Carpets		88 00		
J. D. Williamson & Co	do		42 80		
J. Hogg & Son	Curtains, etc		81 63		
J. M. Bond & Co	Table furnishings		21 00		
J. Edgar & Son	do		76 99		
A. McBean	do		30 25		
G. Harrison	Glassware		11 00		
J. A Wood	do		6 00		
J. Kennedy & Co	Castor		11 00		
McQuillan & Co	Mantle grate		60 00		
Caleb Chase	Phæton		145 00		
Beadle & Buchanan	Trees		106 00		
Hoopes Bros. & Thomas	do		41 55		
C. Arnold	do		89 36		
A. M. Smith	do		7 80		
R. Purdom	Travelling expenses		28 50		
K. Tully	do		52 35		
F. P. O. Callaghan	Services and expenses		16 00		
Sundry newspapers	Advertising		85 20		
				21,797 03	
	EDUCATION DEPARTMENT AND NORMAL SCHOOL.				
George Ringham	Tinsmithing		58 75		
Ritchie & Co	Plumbing		85 75		
D. S. Keith & Co	do		322 82		
M. O'Connor	Painting		101 96		
R. Jones	Bricklaying, etc		262 15		
Westman & Baker	Press machinery		150 00		
Thomas Nightingale	Sewer-pipes		154 40		
E. Terry	Cement, etc		3 50		
J. B. Smith	Lumber		33 47		
J. P. Wagner & Co	Mantelpieces		12 30		
C. J. Whitehead	Grates		18 50		
Robert Swarr	do		13 50		
John Cochrane	Sodding		350 00		
				1,567 10	
	NORMAL SCHOOL, OTTAWA.				
Lyons & Robbillard	Account Contract		16,493 50		
G. Harding	do		2,500 00		
James Smart	do		1,756 50		
	Carried forward		20,750 00	107,062 35	1,835,482 42

PUBLIC BUILDINGS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		20,750 00	107,062 35	1,885,482 42
	NORMAL SCHOOL, OTTAWA.—*Continued.*				
Corporation of Ottawa	Planking for sidewalk	55 00			
do	Share of construction of sewer	1,036 00			
			1,091 00		
Blyth & Kerr	Plumbing	38 10			
Butterworth & Co	do	37 62			
			75 72		
Rice Lewis & Son	Bell	15 25			
Joseph Boyden	Furniture	61 00			
			76 25		
James Smart	School-seats		483 00		
J. White	Services clerk of works		1,099 00		
P. McGregor	Flower-pots	6 50			
A. Robillard	Sodding	40 54			
E. Hawkins	Castings	15 50			
James Mooney	do	51 46			
T. Coldroy	do	1 50			
			115 50		
K. Tully	Travelling expenses	140 50			
R. Purdom	do	28 00			
			168 50		
Sundry newspapers	Advertising, etc.	20 30			
Sundry persons	Services on grounds	68 00			
			88 30		
				23,947 27	
	SCHOOL OF PRACTICAL SCIENCE.				
Hon. A. Crooks	To pay for apparatus	1,359 00			
Educational Depository	Apparatus	137 37			
Warmbrum, Quiltiz & Co	do	487 26			
			1,983 63		
Thomas Sheard	Lumber	102 49			
J. B. Smith	Sashes	31 00			

G. Gall	Carpentering	89 09			
D. S. Keith & Co	Plumbing	210 90			
R. R. Wright	Apparatus	500 00			
J. Galbraith	do	875 37			
Prof. E. J. Chapman	do	500 00			
			2,308 85		
				4,292 48	
	OSGOODE HALL.				
G. & E. Evans	Furnishings	47 33			
P. Paterson & Son	Hardware	8 75			
J. B. Smith	Lumber	4 82			
			60 90		
Gutta-Percha Rubber Co	Matting	79 21			
R. Jones	Bricklaying	100 30			
W. H. Boxall	Tinsmithing	12 38			
D. Forbes	Repairing roof	347 00			
			536 89		
W. J. Maguire	Plumbing	456 77			
J. Murphy	Plastering	6 00			
T. Lalor, jr	Locksmithing	18 30			
M. O'Connor	Painting	85 15			
			566 22		
				1,166 01	
	GOVERNMENT HOUSE, TORONTO.				
R. Hay & Co	Furniture and furnishings	904 15			
G. Harrison	do	678 84			
J. Kay	do	1,020 02			
			2,603 01		
W. Milligan	Painting	649 94			
J. Ritchie	Plumbing	257 05			
P. Burns	Manure	16 00			
J. A. Simmers	do	8 00			
J. O'Connor	Potting soil	15 00			
			945 99		
J. Ryan, sr	Services on grounds	71 70			
J. Ryan, jr	do	195 00			
			266 70		
				3,815 70	
	PARLIAMENT BUILDINGS.				
The Gutta-Percha Manf'g Co	Hose and couplings	.....	.....	178 25	
	ALGOMA DISTRICT.				
Provincial Reformatory	Furnishings, Lock-up, Gore Bay	8 40			
P. Hennesy	Furniture, do do	87 20			
A. Hogg	Furnishings, do do	5 42			
	Carried forward	101 02	.....	140,462 06	1,885,482 42

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	101 02		140,462 06	1,885,482 42
	ALGOMA DISTRICT. *Continued.*				
S Olmstead	Furnishings, Lock-up, Gore Bay	6 35			
D. Miller & Sons	do do do	4 65			
E. H. Jackson	do do do	5 00			
			117 02		
P. Paterson & Son	Stoves, Lock-up, Manitoulin Island	36 50			
Bryce, McMurrich & Co	Bedding, do Gore Bay	50 60			
Central Prison Industries	Furnishings, do	27 50			
			114 60		
R. Thorburn	Freight do do		6 45		
				238 07	
	THUNDER BAY DISTRICT.				
Thomas Marks & Bro	Furniture	10 50			
R. Laird	Hose pump	72 00			
G. H. Kennedy	Wire screen	12 00			
			94 50		
P. S. Griffin	Iron-work	189 60			
Thomas Marks & Bro	Hardware	4 54			
H. Weiland	Lumber	31 68			
G. A. Graham	Lime	119 28			
G. Lantench Page	Lumber	67 29			
Clarke Bros	Paint	7 45			
Oliver Davidson & Co	Lumber	31 61			
R. Holmes	do	44 00			
J. Davidson	do	17 41			
M. Street & Bro.	Paint	36 27			
			549 16		
R. Wood	Freight		7 33		
				650 99	
	MUSKOKA AND PARRY SOUND.				
H. A. Richards	Repairs, Registry Office, P. S.			10 00	
	Total Public Buildings				141,361 12

PUBLIC WORKS.

MUSKOKA RIVER WORKS.

G. J. Beattie	Supplies	39 37		
Henry Sewry	do	120 79		
J. T. Harvie	do	7 78		
T. Lennox	do	36 92		
Farquarson & Dutton	do	142 05		
W. Ryan	do	164 00		
G. McMillan	do	110 72		
A. P. Cockburn & Co.	do	61 12		
E. Guinane	do	3 50		
J. Bisonette	do	15 00		
J. Hall	do	9 49		
G. Parlett	do	3 50		
Cashman Bros.	do	14 62		
Miller & Graham	do	11 35		
H. Perryman	do	15 23		
Sorrain & Hughes	do	2 53		
			757 77	
James Prenty	Timber, etc.	157 26		
J. Bellefeule	do	581 04		
Muskoka Mill & Lumber Co.	do	1,581 26		
G. Besley	do	116 65		
T. Burgess	do	38 54		
			2,474 75	
Rice Lewis & Son	Hardware	7 45		
McLennan & Co	do	89 86		
J. Henderson	do	28 49		
P. Paterson & Co	do	136 30		
P. Buchan & Co	do	16 79		
S. Jarrat	do	8 45		
			287 34	
Prunty & Hanna	Teaming	8 00		
J. T. Harvey	do	10 00		
Geo. Hall & Co.	Boat-hire	2 25		
			20 25	
L. Love	Repairing chain		20 55	
R. McCallum	Travelling expenses	87 65		
W. Edwards	do	12 30		
Allan Gunn	do	288 81		
Thos. Walters	Disbursements	74 72		
W. Willson	Travelling expenses	10 95		
S. G. O'Grady	do	487 55		
A. Mills	do	53 54		
			1,015 52	
	Carried forward		4,576 18	2,026,843 54

PUBLIC WORKS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		4,576 18		2,026,843 54
	MUSKOKA RIVER WORKS.—*Continued.*				
Muskoka Steamboat Line	Freight	44 50			
A. P. Cockburn & Co.	Freight, etc.	51 66			
R. P. Scriven	Stove, etc.	25 55			
D. Kent	Board of Men	7 00			
E. Guinane	Services care of dredge	10 00			
Pay Lists	Men employed	2,517 40			
			2,656 11		
	GULL AND BURNT RIVER WORKS.			7,232 29	
G. H. Bertram	Hardware	235 48			
P. Paterson & Son	do	3 63			
A. L. Walker	do	1 20			
J. Makins	do	14 59			
McLennan & Co	do	8 39			
			263 29		
C. Davis	Lumber	20 00			
Mrs. Mitchell	do	16 00			
J. H. Delamere	do	11 70			
R. McDougall	do	30 12			
Canada Land & Immigration Co	do	213 02			
			290 84		
Milne & Graham	Supplies	31 70			
W. Gregory	do	3 90			
E. E. McTavish	do	110 49			
J. Chisholm	do	58 04			
C. L. Baker	do	261 14			
J. Wassals	do	40 00			
J. Anderson	do	19 23			
A. Cullen	do	29 10			
A. D. & G. Thompson	do	4 65			
R. Finley	do	8 63			
Gainor & Mooney	do	1 68			
Wallace & Dundas	do	12 00			
W. Howe	do	11 95			

P. Hobden	Supplies	21 60		
J. Pearce	do	19 84		
J. R. Young	do	7 10		
G. L. Merry	do	14 05		
G. Ingles	do	3 10		
A. Campbell	do	24 13		
J. Dutton	do	10 08		
W. Pring	do	39 75		
G. F. Young	do	336 28		
			1,071 44	
A. Brooks	Board of men	13 60		
W. Welsh	do	62 85		
A. J. Archer	do	35 90		
			112 35	
John Free	Teaming	21 00		
R. McKelvey	do	92 20		
D. Bowen	do	10 23		
J. R. Erskine	Blacksmithing	6 47		
			129 90	
Thomas Walters	Travelling expenses, etc	337 19		
S. G. O'Grady	do	118 74		
G. W. Rose	do	22 20		
R. McCallum	do	28 35		
A. Mills	do	11 40		
			517 88	
Pay lists	Men employed		4,780 66	
				7,166 36
	MARY'S AND FAIRY'S LAKES WORKS.			
R. E. Perry	Supplies	38 99		
A. F. Button	do	7 21		
Hovey & Willis	do	10 40		
J. Sturges	do	15 06		
G. W. Rose	do	26 81		
			98 47	
Scarlett & Fitterley	Lumber		457 67	
P. Paterson & Son	Chains	22 40		
G. & J. Beattie	Rope, etc	12 35		
Denton, Smiley & Co.	Dredge machinery	26 60		
H. Goodman	Repairs iron work	5 55		
			66 90	
J. Mortimer	Teaming	6 75		
Muskoka Steamboat Line	Freight	10 00		
			16 75	
A. Gunn	Travelling expenses	49 10		
G. W. Rose	do	6 85		
R. McCallum	do	11 80		
			67 75	
	Carried forward		707 54	14,398 65	2,026,843 54

PUBLIC WORKS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		707 54	14,398 65	2,026,843 51
	MARY'S AND FAIRY'S LAKES WORKS. *Continued.*				
J. Shay	Board of men	56 86			
J. W. Jacobs	do	5 75			
Pay List	Men employed	557 64			
			620 25		
				1,327 79	
	OTONABEE RIVER WORKS.				
G. J. Chalmers	Lumber		1,084 40		
W. Hamilton	Bolts	32 41			
Bertram & Co.	Chain	8 69			
T. Harrington	Stone	36 00			
			77 10		
J. Lanning	Blacksmithing		8 35		
A. Ross	Freight	18 53			
P. Young	Posting bills	1 50			
D. Henthorn	Tanning	5 00			
			25 03		
Sundry newspapers	Advertising		7 50		
T. Walters	Travelling expenses	22 65			
S. G. O'Grady	do	16 55			
			39 20		
E. Savoy	Board of men	81 22			
Pay lists	Men employed	554 33			
			635 55		
				1,877 13	
	SURVEYS, INSPECTIONS, ARBITRATIONS AND AWARDS.				
Col. A. Taylor	Services and expenses, *re* Credit Valley Railway Arbitration	69 50			
W. McBurney	do do do	69 50			
T. D. Delamere	do do do	106 50			
J. L. Smith	Valuating Central Prison lands	72 00			
Col. A. Taylor	Services *re* King Street land arbitration	37 50			
W. McBurney	do do	37 50			
W. Mulock	do do	60 00			
O'Leary & O'Leary	Law fees	5 44			
R. Dunn	Witness' Fees	2 00			
			459 94		

T. Snarr	Services *re* King Street land arbitration	8 00			
E. B. Osler	do do	10 00			
W. L. Hime	do do	10 00			
J. Fraser	Services, *re* surveys	2 25			
			30 25		
E. McTavish	Supplies	6 97			
F. Doris	Boat-hire	7 00			
C. Bowens	horse-hire	3 00			
H. Workman & Son	do	16 00			
J. T. Harris	do	24 00			
			56 97		
T. Walters	Travelling expenses	136 58			
R. McCallum	do	248 97			
A. Gunn	do	37 49			
W. J. S. Holwell	do	15 10			
R. P. Fairbairn	do	38 20			
G. Taylor	do	30 90			
Pay lists	Men employed	144 27			
			651 51		
				1,198 67	

LOCKS, DAMS, AND SWING BRIDGES.

Repairs, Etc.

Wm. Brokenshire	Services as lock-master, Balsam River	243 95			
R. Douglass	do Lindsay	349 78			
R. McCausland	do do	187 50			
T. Bargess	do do	210 00			
P. H. O'Beirne	do Port Carling	241 00			
Julius Shay	do Mary and Fairy Lakes	254 10			
Patrick Young	do Young's Point	240 00			
James Prunty	Services as slide-master, Muskoka Falls	225 00			
			1,951 33		
T. Walters	do Superintendent of locks		1,200 00		
R. Bryans	Supplies	5 00			
A. P. Cockburn & Co	do	6 50			
George B. Bisley	do	17 38			
Parish & Barclay	do	4 05			
J. L. Fetterly	do	4 70			
R. Hovey	do	7 95			
A. F. Button	do	3 01			
G. Paget	do	5 05			
G. T. Harvie	do	14 50			
R. S. Porter	do	3 49			
J. & R. Begley	do	4 25			
J. Thurston	Lumber	10 94			
G. J. Chalmers	do	4 57			
A. S. Smith	do	9 60			
P. Paterson & Son	Hardware	22 40			
	Carried forward	122 79	3,151 33	18,802 24	2,026,843 54

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward	122 79	3,151 33	18,802 24	2,026,843 54
	LOCKS, DAMS, AND SWING BRIDGES. *Continued.*				
	REPAIRS, ETC.—*Continued.*				
Scarlett & Fetterly	Lumber	15 52			
George Ingle	do	42 91			
M. Boyd	do	74 96			
Needler & Sadler	do	603 76			
J. McLaughlin	do	12 00			
McLennan & Co	Hardware	83 24			
G. H. Bertram	do	6 84			
C. L. Baker	Lime	26 00			
J. McGinley	Stone	38 50			
B. Morey	Castings	281 86			
J. Makins	do	294 10			
H. Goodman	do	7 40			
A. L. Walker	Bolts, etc.	5 35			
F. R. Curry	Brushes	2 01			
W. Power & Co	Use of diving apparatus	219 80			
M. Morrison	Blacksmithing	7 92			
A. Cullen	do	17 35			
G. Fitzgerald	do	1 50			
Robert Ritchie	Repairing slide	10 00			
J. Gronden	Bricklaying	27 99			
G. Stevenson	Tinsmithing	5 22			
J. Harvey	Teaming	10 60			
W. Richardson	do	11 50			
R. McKelvey	do	9 00			
J. Bowie	do	25 75			
H. Workman & Son	do	18 65			
W. Zeufelt	do	4 75			
T. Goodwin	do	5 00			
P. Dorris	Boat-hire	22 00			
T. Walters	Disbursements	116 43			
J. Pearce	Supplies	3 60			
G. W. Ross	Travelling expenses	21 20			
R. McCallum	do	17 45			
S. G. O'Grady	do	20 86			

A. Ross	Travelling expenses	49 60			
A. Mills	do	61 85			
C. Percival	Board of men	12 00			
W. Welsh	do	3 28			
D. Armstrong	do	10 72			
S. Ritchie	do	14 30			
D. Kent	do	2 50			
S. B. Fish	do	7 00			
Sundry newspapers	Advertising	11 20			
Pay lists	Men employed	2,003 94			
J. Tasker	Lumber	11 96			
J. Cooper	do	32 29			
C. Davis	do	7 35			
			5,621 74		
				7,573 07	
	Total Public Works				26,375 31

COLONIZATION ROADS

John O'Donnell	On account of work done	Anglesea Road			334 02
F. Beaseley	do	Addington Road			668 32
A. Gibbons	do	Admaston Road			721 01
S. Ryan	do	Algoma and Pembroke Road			400 00
T. Jackson	do	do do			500 00
Wm. Thure	do	do do No. 1			592 00
Wm. Hartle	do	Ansou Road			200 00
J. Hillyard	do	Brunel Road 4th and 5th Con			200 96
G. W. Dawson	do	Barrie Road			450 00
P. Devana	do	Buck L. Bridge Road			407 07
P. Devine	do	Brudenel Road			350 00
M. Whelan	do	Bagot and Opeongo Junction			450 00
D. Taylor	do	Bagot and Calaboga Road			600 00
R. Proctor	do	Bruce Mines Road			900 00
R. McMurray	do	Baysville and Gravenhurst Road			650 00
J. B. McWilliams	do	Buckhorn Road			200 00
P. M. Sharman	do	Brunel 4th Con. Road			200 00
Wm. Hartle	do	Bobcaygeon Road			400 00
do	do	do			500 00
J. B. McWilliams	do	Burleigh and Methuen Road			300 00
do	do	Burleigh and Buckhorn Road			600 00
do	do	Bobcaygeon Road			300 00
T. May	do	Baysville, Muskoka, and Bobcaygeon Road			250 00
	Carried forward			10,173 38	2,053,218 85

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward			10,173 38	2,053,218 85
	COLONIZATION ROADS.—*Continued.*				
T. May	On account of work done, Baysville Road			100 00	
F. B. Day	do Bridges "U" line, St. Joseph's Island			20 60	
John Dooner	do Cobden and Eganville Road			400 00	
J. B. McWilliams	do Chandos Road			785 00	
John McCartney	do Croft Road			481 50	
D. Campbell	do Centre Road			500 00	
G. Marshall	do Cobden and Westmeath Road			900 00	
G. Eckford	do Cobden and Pembroke Road			301 15	
D. Ferguson	do Cardwell Road			744 42	
J. Breen	do Cobden and Eganville Road			474 75	
A. McKenzie	do Cardwell Junction			383 61	
R. Armstrong	do Cobden and Dalton, S			500 00	
J. McDonald	do do N			450 00	
D. Johnson	do Cumbemere Bridge			65 00	
D. Campbell	do Campment D'Ours			300 00	
R. Proctor	do Coffin Road			600 00	
S. Lane	do Denbeigh Road			600 00	
E. Ryan	do Dacre and Mt. St. Patrick Road			173 23	
J. Gilmour	do Doe Lake Road			374 92	
R. Stewart	do Draper and Gravenhurst Road			250 00	
Thomas Halliday	do Distress River Bridge			400 00	
Wm. Margach	do Dawson Road Bridge			116 58	
F. Richardson	do Eagle Lake Road			1,200 00	
John Boyd	do East Lake Bridge			775 07	
John Dooner	do Eagansville and Foy Road			300 00	
F. Richardson	do Eagle Lake and Parry Sound Road			582 28	
Thomas Healy	do Foley's Junction Road, No. 2			350 00	
R. Flynn	do Frontenac Road			523 73	
W. Fitzgerald	do Fornoy and Frontenac Road			300 00	
Thomas Healy	do Foley Road			50 00	
John D. McRae	do Golden Lake Bridge			854 00	
T. R. Caston	do Gurd Bridge			750 00	
J. D. Simpson	do Gore Bay Road			500 00	
A. McDonald	do Grattan Road, No. 2			300 00	
M. McDonnell	do Grattan Road, No. 1			495 29	
R. Stewart	do Gravenhurst and Ryde			450 00	

James Barrett	do	Gurd Road			200 00	
J. Boyd	do	Goulias River Bridge			1,500 00	
R. Proctor	do	Galbraith Road			800 00	
R. Stewart	do	Gravenhurst and Baysville				
George McCaskell	do	Horton and Ross Road			51 65	
D. Kavanagh	do	Hastings Road			1,200 00	
John Holly	do	Hyde Chute Road			500 00	
N. Burgess	do	Hyde Chute Road			200 00	
W. Robinson	do	Harney Road			300 00	
N. Bourgignon	do	Hyde Chute Road			267 77	
Alex. Chisholm	do	Indian Peninsular Road			779 34	
B. Watkins	do	Junction Road			949 64	
Thos. Healy	do	Junction Road No. 2			200 00	
A. G. Judd	do	Kearney Road, W			350 00	
John McLaren	do	Kaministiquia Road			750 00	
W. Margach	do	Kaministiquia and Pigeon River Road			200 00	
W. B. Mills	do	Kennebec Bridge			500 00	
A. G. Judd	do	Monteith and Perry			1,300 00	
J. D. Simpson	do	Manitoulin Roads			1,380 00	
A. G. Judd	do	Muskoka, N.			500 00	
Geo. Hamilton	do	Minor's Bay Road			1,110 00	
W. Hartle	do	Minden Road			400 00	
Thos. McGowan	do	Mills Road			1,987 03	
J. McKenzie	do	Mississippi			539 50	
J. Boyd	do	Muskoka Road			919 67	
W. F. Haines	do	Muskoka Road No. 2			730 33	
W. Dowing	do	Musquash Road			789 13	
Wm. Hartle	do	Monck, Lutterworth and Buckhorn			1,100 00	
J. G. Neville	do	McDougall and Foley Junction			375 00	
John Thompson	do	McKellar Centre			575 50	
J. B. McWilliams	do	Methuen			200 00	
Thos. E. Hay	do	Macaulay Road No. 1			650 00	
W. H. Brown	do	do No. 2			1,450 00	
P. M. Shannon	do	do No. 3			200 00	
J. Fluker	do	Maganetawan			300 00	
T. May	do	Muskoka and Bobcaygeon			427 47	
J. D. Simpson	do	Mudge Bay Road			250 00	
John Boyd	do	Matthias Bridge			300 00	
E. Ryan	do	Mount St. Patrick Road			200 00	
Geo. Kelcey	do	Northern Road No. 2			878 02	
Thos. R. Caston	do	Northern Road			1,050 00	
J. Armstrong	do	Northern Road, S.			1,493 74	
J. Gemmill	do	Nipissing			800 00	
W. Margach	do	Oliver Road			1,800 00	
A. Wright	do	do			56 00	
J. Whelan	do	Opeonga Road			500 00	
E. & G. Towel	do	Oliver Road			68 00	
H. Humphrey	do	do			57 00	
W. Margach	do	Oliver and Kaministiquia Road			500 00	
		Carried forward			58,158 03	2,053,218 85

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward			58,158 03	2,053,218 85
	COLONIZATION ROADS.—*Continued.*				
John Boyd	On account of work done, Pickerel Lake Bridge			500 00	
do	do Pickerel Lake and Rae's Mill Bridges			400 00	
J. McKellar	do Pigeon River Road			1,000 00	
W. Hartle	do Peterson Road			400 00	
J. Leblanc	do Perault's Settlement			300 00	
A. Hepburn	do Port Finlay Road			390 15	
M. Sheedi	do Pembroke and Osceola Road			300 00	
John Barrand	do Pembroke and Mattawa Road			800 00	
J. Malkins	do Port Vernon			767 00	
F. Richardson	do Parry Sound Road			900 00	
F. B. Day	do Port Lock Road			559 20	
J. D. Simpson	do Providence Bay and Little Current Road			1,000 00	
J. Fitzgerald	do Peterson Road			450 00	
J. Barrand	do Pembroke and Oliver Road			1,200 00	
John Boyd	do Rae's Mill Bridge			726 46	
A. G. Judd	do Rousseau and Nipissing			1,950 00	
John F. Day	do Root Road Bridge			47 57	
R. Proctor	do Rose and Lefroy			381 34	
John Boyd	do Rousseau and Nipissing			100 00	
A. G. Judd	do Scotia			200 00	
Wm. Hartle	do Snowden Road			900 00	
J. Richards	do St. Joseph's Island			128 12	
J. D. Simpson	do Sandfield Bay Road			200 00	
J. Shibley	do Sharbot Lake Road			321 64	
M. Gallagher	do Sebastopol			300 00	
J. Darling	do Stisted Road			600 00	
R. N. Hill	do Sinclair Road			378 99	
A. H. Ladell	do Stisted Swamp Road			200 00	
W. Hartle	do Stanhope and Bobcaygeon			900 00	
J. D. Simpson	do South Bay Road			650 00	
J. Fluker	do Spence Road			250 00	
T. R. Caton	do Shawanaga Bridge			500 00	
P. M. Shannon	do Stephenson Town Line Road			250 00	
T. R. Caton	do Shawanaga and Gurd Bridge			200 00	

J. Fluker	do	Spence and Maganetawan Road			86 02	
L. H. Smith	do	Tamworth and Oso			408 94	
D. Campbell	do	Tenly Bay Road			350 00	
G. Hamilton	do	Tudor Road			420 00	
J. O'Neil	do	Wilberforce Road			298 53	
D. M. Card	Inspecting, etc				1,950 00	
C. F. Aylesworth	do				950 00	
W. Hewitt & Co	Supplies				1,499 16	
R. Jaffray	do				3,739 53	
R. H. Ramsay & Co	do				2,764 18	
William Ryan	do				5,154 06	
P. Nolan	do				244 50	
Petley & Co	do				617 01	
James Adams	do				27 90	
E. McKeown	do				1,353 78	
James Nolan	do				337 89	
Alexander Thompson	do				16 50	
J. Lewis	do				31 54	
N. R. Street	do				282 05	
		Total Colonization Roads				96,839 99

CROWN LANDS EXPENDITURE.

BOARD OF SURVEYORS.

G. B. Kirkpatrick	To pay expenses of board, January, April, July and October Sessions, 1880				325 00	

AGENTS' SALARIES, COMMISSIONS AND DISBURSEMENTS.

Anderson, D.	Salary and disbursements			395 32		
Best, S. G.	do			386 38		
Bick, George	Inspections			30 00		
Bell, C. E	Timber services			100 00		
Brown, C. P.	Salary and disbursements			400 10		
	Carried forward			1,311 80	325 00	2,150,058 84

CROWN LANDS EXPENDITURE.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		1,311 80	325 00	2,150,058 84
	AGENTS' SALARIES, COMMISSIONS AND DISBURSEMENTS—*Continued.*				
Buist, D. E.	Inspections		29 50		
Cadenhead, A. S.	Disbursements		1 20		
Crozier, J. A. G.	Salary and travelling expenses		543 07		
Dawson, J. R.	do inspections and disbursements		387 07		
Day, John F.	do do		311 81		
Day, F. B.	Inspections		142 50		
Day, Joseph F.	Salary		125 00		
Edwards, W.	Protecting islands Ottawa river		20 00		
Fitzgerald, J. W.	Salary and disbursements		272 75		
Freeman, P. W.	Inspections		346 81		
Fitzgerald, J.	Salary		125 00		
Green, John	Inspections		165 00		
Hamilton, H.	Commission and disbursements		71 92		
Handy, E.	Salary, inspections and disbursements		419 40		
Jackson, George	Commission		106 00		
Johnson, Thomas E.	Salary and disbursements		1,606 76		
Johnson, S. M.	Inspections		30 00		
Jackson, Wm., estate of	Disbursements		5 92		
Kennedy, John	Inspections		40 00		
Kennedy, A.	Salary, inspections and disbursements		420 04		
Kennedy, George	Expenses		24 00		
Mahon, J.	Salary		375 00		
Margach, W.	Inspections		207 40		
Macdonald, D. F.	do		40 00		
Mackay, H.	Salary and disbursements		401 27		
Macpherson, R.	do		386 77		
McDonald, J.	Salary		137 50		
McKibbon, J.	Commission		23 72		
McGowen, W.	Measuring logs		42 00		
McNabb, A.	Commission and disbursements		204 48		
McWilliams, J. B.	Salary, travelling expenses, board, and disbursements		2,239 99		
Perry, E.	Disbursements		11 87		
Reeves, J.	Salary		375 00		
Russell, A. J.	Disbursements		36 28		
Scarlett, J. S.	Salary, disbursements, etc.		205 21		

Shaw, Joseph	Inspections		54 80		
Tait, J. R	Salary and disbursements		384 34		
Way, Joseph F	do		1,660 00		
White, A	Salary, inspections and disbursements		506 20		
Wilson, Joseph	Timber services		260 00		
Wright, A	Salary and disbursements		393 06		
				14,480 44	
	FOREST RANGING AND INSPECTION OF TIMBER LANDS.				
Bick, George	Services and disbursements		1,164 19		
Brady John	do		640 00		
Campbell, J. B	do		697 09		
Crowe, N	do		63 00		
Day, J. F	do		147 50		
Freeman, P. W	do		1,100 00		
Johnson, S. M	do		1,300 00		
Kennedy, John	do		780 00		
Lee, J. W	do		494 83		
Londry, L	do		141 10		
Macdonell, D. F	do		800 00		
Russell, Wm	do		600 00		
Shaw, J	do		1,476 16		
Smith, J. W	do		1,115 62		
Sopper, S. L	do		422 00		
Starkey, A	do		24 00		
Turgeon, J. B	do		660 00		
White, A	do		82 00		
				11,707 40	
	SURVEYS.				
R. H. Coleman	Survey Township of	Caldwell	1,200 00		
E. Stewart	do	Chisholm	3,400 00		
D. Beatty	do	Cowper and Conger	4,100 00		
W. D. Lyon	do	Rainey River	72 00		
Alex. Niven	do	Ferris	3,700 00		
Thomas Byrne	do	Gibson	4,529 00		
Lawrence Fallon	do	Gurd, Nipissing and Himsworth	1,900 00		
M. J. Butler	do	Mayo and Dungannon	1,400 00		
G. B. Abrey	do	McMahon	1,000 00		
J. W. Fitzgerald	do	Patterson and Hardy	4,200 00		
James Dickson	do	Peck	3,566 58		
J. K. McLean	do	Springer	2,500 00		
D. Beatty	do	Wallbridge	107 10		
Wm. Bell	Survey of timber limits		331 03		
	Carried forward		31,945 71	26,512 84	2,150,058 84

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		31,945 71	26,512 84	2,150,058 81
	SURVEYS—*Continued.*				
L. Bolton	Inspection of surveys		287 92		
Copp, Clark & Co	Maps		300 00		
				32,533 63	
	Total Crown Lands Expenditure				59,046 47

REFUNDS.

EDUCATION.

Armstrong, W. E	Refund subscription Superannuation Fund		8 00		
Anderson, M	do		11 00		
Attridge, S	do		16 00		
Armstrong, R	do		13 00		
Alexander, R. L	do		3 00		
Adair, J. S	do		5 00		
Armstrong, S	do		35 00		
Armstrong, S	do		13 00		
Allen, L	do		47 50		
Agnew, A	do		2 00		
Armstrong, J	do		11 00		
Beemer, A	do		4 00		
Beckstead, N. L	do		6 00		
Bremner, M	do		6 00		
Brereton, T. G	do		4 00		

Booth, R. S	do			6 00		
Bellamy, J. S	do			12 00		
Bryce, William	do			18 00		
Boughner, E	do			35 00		
Burnham, T	dd			12 00		
Burr, J	do			17 00		
Balfour, D	do			2 00		
Black, J. C	do			2 00		
Bingham, J. O	do			4 00		
Blair, R. J	do			9 00		
Brown, T. D	do			16 00		
Barkey, F	do			2 00		
Brown, H. C	do			16 00		
Brown, W	do			5 00		
Bell, A., jun	do			77 00		
Biggs, W. T	do			10 00		
Bell, L. B	do			12 00		
Buggy, P	do			3 00		
Barr, R	do			10 00		
Bowman, A. F	do			6 00		
Barber, S	do			6 00		
Briggs, Mrs. J	do			42 72		
Byers, Mrs. A	do			19 03		
Cleary, Mrs	do			24 00		
Campbell, N. B	do			6 00		
Clarke, G. M	do			6 00		
Clancey, W. R	do			6 00		
Cunnings, T. H	do			16 00		
Case, T. E	do			8 00		
Conley, J	do			5 00		
Cooper, H. P	do			6 00		
Caldwell, J. W	do			3 00		
C. Catherwood	do			6 00		
Campbell, W. H	do			4 00		
Coleman, J	do			12 00		
Colquhoun, M	do			4 00		
Carmichael, D	do			6 00		
Cockburn, C. A	do			4 00		
Christie, E	do			10 00		
Conboy, D	do			2 00		
Conway, R	do			9 00		
Curry, R. N	do			45 00		
Crowder, S. A	do			18 00		
Cahill, A. W	do			5 00		
Cross, T	do			10 00		
Cook, E. M	do			11 00		
Clark, D	do			3 00		
Campbell, N	do			6 00		
Crebbin, Mrs. T	do			4 00		
Carried forward				768 25		2,209,105 31

REFUNDS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		768 25		2,209,105 31
	EDUCATION.—*Continued.*				
Dulmadge, D. W	Refund Subscription Superannuation Fund		82 00		
Duncan, W. A	do		12 00		
DeWolfe, M. J	do		5 00		
Duncan, R	do		11 00		
Douglas, J	do		10 00		
Dick, John	do		3 00		
Dickie	do		15 00		
Doan, J	do		4 00		
Davidson, J	do		6 00		
Draper, J. S	do		6 00		
Dickinson, H	do		17 00		
Dalziel, J. B	do		10 00		
Dudley, D. F	do		7 00		
Elliott, J. E	do		4 00		
Emrick, P. W	do		9 00		
Evans, J. G	do		7 00		
Elliott, J. C	do		24 50		
Evans, Charles	do		5 00		
Earl, R	do		7 00		
Empey, E. A	do		57 50		
Elliot, M. R	do		6 00		
Fetterley, J. A	do		70 00		
Foley, M. C	do		5 00		
Fleming, R. A	do		17 00		
Farrington, J. H	do		17 00		
Fuller, C	do		8 00		
Flether, J	do		10 00		
Ferguson, J. J	do		2 00		
Green, W. J	do		4 00		
Glass, G	do		19 00		
Gough, J. W	do		6 00		
Grant, D. M	do		1 00		
Griggs, J	do		6 00		
Gray, J. E	do		4 00		
Galloway, W. D	do		2 00		
Gilmour, N	do		4 00		

Gardiner, F. C	do		6 00		
Goward, G	do		2 00		
Grier, D	do		16 00		
Godfrey, T. J	do		9 00		
Gamble, J	do		6 00		
Godfrey, T. J	do		1 00		
Gosnell, E	do		3 00		
Gross, J. F	do		4 00		
Gamble, J	do		2 00		
Honsberger, H. F	do		4 00		
Henderson, J. M	do		8 00		
Henderson, E. W	do		10 00		
Hall, R. E	do		2 00		
Hodges, Seth	do		2 00		
Handford, C	do		9 00		
Hillis, W	do		8 00		
Hingston, J	do		4 00		
Hammond, W	do		8 00		
Hislop, T	do		5 00		
Hall, T	do		19 00		
Hambly, L. E	do		6 00		
Hodgins, C. C	do		10 00		
Hall, J. L	do		3 00		
Hislop, J	do		6 00		
Illman, Wm	do		4 00		
Irvine, C. R	do		3 00		
Irvine, E	do		10 00		
Irwin, H. E	do		3 00		
James, J. H	do		13 00		
Johnstone, J. R	do		12 00		
Johnstone, D. D	do		6 00		
Johnstone, J. M	do		11 00		
Johnston, A	do		6 00		
Johnston, D	do		14 00		
Jones, J. L	do		5 00		
Jackson, J	do		9 98		
Kelly, R. J	do		3 00		
Kellow, W. J	do		2 00		
Kester, A	do		14 00		
Kinnee, C	do		6 00		
Keeley, T. J	do		6 00		
King, J	do		15 00		
Kingston, J	do		3 00		
Leonard, R	do		4 00		
Lee, A	do		15 00		
Lett, F. G	do		9 00		
Lockyer, C	do		6 00		
Lewis, W	do		9 00		
Large, A	do		5 00		
Carried forward			1,598 23		2,209,105 31

REFUNDS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		1,593 23		2,209,105 31
	EDUCATION—*Continued.*				
Lacy, W. J	Refund Subscription Superannuation Fund		2 00		
Lindsay, J. R	do		7 00		
Lake, A	do		4 00		
Lean, T. C	do		16 00		
Law, J	do		10 00		
Lane, M	do		1 00		
Laylor, H	do		4 00		
Lecombe, L	do		12 00		
Lecomte, L	do		1 00		
Livingston, S. G	do		5 00		
Mins, Mrs. J	do		44 82		
Meloche, R	do		7 00		
Morrison, H	do		6 60		
Morrison, J	do		4 00		
Mawcson, H. P	do		10 00		
Morse, W. O	do		4 00		
Munro, George	do		8 00		
Misenir, M	do		13 00		
Malone, S	do		4 00		
Miller, E. A	de		11 00		
Mills, W. F	do		4 00		
Marshall, T	do		10 00		
Mills, W. J	do		4 00		
Marlatt, J	do		11 00		
Monaghan, G	do		10 00		
Martin, J. F	do		5 00		
Mann, J. H	do		10 00		
Myrick, C, J	do		6 00		
Mounker, A. C	do		4 00		
Murphy, Mrs. M	do		39 72		
Mangan, R	do		8 00		
Mather, C. L	do		4 00		
Malcolm, F. B	do		8 00		
Moore, T. B	do		10 00		
Morley, F	do		4 00		
McKean, J. G	do		6 00		

McLung, J	do			14 00		
McLeod, A	do			3 00		
McKeown, S	do			9 00		
McKenzie, A	do			15 00		
McFarlane, W. A	do			17 00		
McKellar, D	do			6 00		
McIntosh, A	do			10 00		
McFadyen, J. M	do			2 00		
McLeod, J. C	do			4 00		
McGurn, E	do			18 00		
McDonald, W	do			4 00		
McGurn, J. S	do			9 00		
McCullough, J. H	do			5 00		
McGregor, G	do			4 00		
McKay, Mrs D	do			47 20		
McDonald, J. J	do			7 00		
McWilliams, R	do			5 00		
McDougall, M. C	do			6 00		
McLain, T.	do			4 00		
McWilliam, J.	do			7 00		
McBride, W.	do			3 00		
McLeod, D. R	do			9 00		
McLean, J	do			1 00		
McDonald, J	do			5 00		
McKerroll, J	do			6 00		
McKellar, A	do			11 00		
McCabe, R. J	do			4 00		
McPhail, W	do			45 00		
McLean, J. A	do			14 00		
McLean, J. H	do			4 00		
Nash, A. S	do			7 00		
Normandine, J. A	do			18 00		
Ness, W	do			7 00		
Neff, A. C	do			8 00		
Nichol, J	do			7 00		
Niven, T	do			10 00		
Olmstead, W. E	do			8 00		
O'Connor, Mrs. M	do			61 00		
Pollock, C	do			59 36		
Potter, D	do			123 50		
Pedley, J. W	do			7 00		
Primeau, N.	do			5 00		
Patterson, G. D	do			7 00		
Purcell, P	do			1 00		
Patterson, D. W	do			8 00		
Prouty, C	do			85 00		
Palmer, J. W	do			2 00		
Richardson, J. O	do			12 00		
Ross, John	do			6 00		
	Carried forward			2,655 78		2,209,105 31

REFUNDS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		2,655 58		2,209,105 31
	EDUCATION.—*Continued.*				
Roche, W.	Refund Subscription Superannuation Fund		4 00		
Rose, D.	do		35 00		
Robinson, M.	do		4 00		
Robinson, T. C.	do		2 00		
Russell, W. H.	do		8 00		
Raney, W. E.	do		4 00		
Rae, J. W.	do		4 00		
Robinson, T. H.	do		13 00		
Read, J.	do		5 00		
Reid, J. W.	do		4 00		
Renshaw, A. C.	do		4 00		
Sellery, W.	do		8 00		
Stephenson, J.	do		6 00		
Seymour, R. F.	do		17 00		
Smith, L. C.	do		1 00		
Sullivan, J. E.	do		3 00		
Stanley, M.	do		13 36		
Smith, J. C.	do		11 00		
Sherridan, S.	do		17 00		
Smith, W. H.	do		11 00		
Scealey, O.	do		4 00		
Smith, A. D.	do		7 00		
Spacey, G. D.	do		9 00		
Smith, G. H.	do		8 00		
Sawyer, D. J. B.	do		3 00		
Steele, J.	do		5 00		
Stuart, P.	do		1 00		
Swayze, J. W.	do		9 00		
Springstead, I.	do		45 00		
Shaw, C. T.	do		8 00		
Stacey, W.	do		5 00		
Shaw, A.	do		12 00		
Scott, J. W.	do		12 00		
Sarquit, W.	do		1 00		
Sauve, J. B. H.	do		6 00		
Sellars, F. W.	do		18 00		

Smith, A.	do		9 00		
Trustees 7 Peel	do		2 00		
Thompson, A.	do		12 00		
Townsend, J. A.	do		7 00		
Trimble, T. B.	do		4 00		
Tracey, T. H.	do		4 00		
Thomson, W. J.	do		6 00		
Tracy, W. J.	do		4 00		
Turnbull, R. B.	do		45 00		
Thompson, J. E.	do		6 00		
Thompson, R. H.	do		6 00		
Tate, T.	do		4 00		
Turnbull, J.	do		3 60		
Thistlewaite, F. W.	do		2 00		
Umbach, M. M.	do		4 00		
Wilson, J. T.	do		4 00		
Wright, M.	do		16 00		
Wilson, W. J.	do		15 00		
Watkins, C.	do		2 00		
Winkworth, J. C.	do		17 00		
Ward, W. M.	do		12 00		
Wright, J. J.	do		8 00		
Whitely, J. B.	do		2 00		
Wilson, T. C.	do		14 00		
Williamson, J. F.	do		5 00		
Weir, A.	do		8 00		
Wilkinson, J.	do		2 00		
Wright, T.	do		6 73		
Walroud, J. E.	do		13 00		
Williams, H. S.	do		10 00		
Winter, G. B.	do		5 00		
Whitney, P. A.	do		6 00		
Zimmer, D.	do		6 00		
				3,252 92	
		CROWN LANDS.			
J. C. McLagan	Refund on lands in	Amaranth	73 00		
W. H. Brouse	do	Anglesea	24 00		
W. R. Robinson	do	Armour	68 00		
Kilburn & Hales	do	Arran	8 70		
E. Brannan	do	Arthur	50 00		
Allan Keating	do	Belmont	16 00		
James H. Eastwood	do	Bruce	1 00		
Bethune & Moss	do	do	109 10		
W. J. Briscoe	do	Bromley	25 00		
A. H. Crysler	do	Brunel	100 00		
James Lawson	do	Brunel	397 50		
Canada Company	do	Camden	147 00		
	Carried forward		1,019 30	3,252 92	2,209,105 31

REFUNDS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		1,019 30	3,252 92	2,209,105 31
	CROWN LANDS.—*Continued.*				
Jones & McQueston	Refund on lands in Carden		50 00		
Emma Dent	do Carling		8 00		
A. Harley	do Digby		64 40		
John M. Henderson	do Dungannon		3 50		
Wm. Bell	do Elderslie		13 06		
W. Mathieson, Jr	do Elma		390 00		
L. G. Choquette	do Elzevir		24 80		
M. Carroll	do Emily		66 06		
Thomas Doyle	do Flos		61 00		
J. G. Currie	do Gainsboro'		8 00		
Allan McInnes	do Glenelg		200 70		
J. H. Hunter	do Glenelg		0 75		
Delamere & Black	do Grattan		7 00		
James F. Dennistown	do Harvey		178 20		
R. Shunn	do Holland		52 20		
H. W. Peterson	do Holland		25 00		
Kenneth Munroe	do Kincardine		57 70		
J. A. McPherson	do Kincardine		14 80		
D. Fitchett	do Lake		10 00		
W. Galna	do Limerick		20 00		
G. E. Greene	do Luther		35 56		
C. H. Greene	do do		18 43		
James S. Pine	do Madoc		30 00		
Thomas Hall	do Medora		7 0		
W. Wilson	do Methuen		20 00		
Geo. Copeland	do McMurrich		1 50		
Lavina A. Gates	do Olden		50 25		
Dennis Driscoll	do Pakenham		10 75		
Peter Brown	do Prince		12 66		
Patrick Cloghacy	do Proton		58 00		
Mary Foran	do Sebastopol		20 00		
C. Gamble	do Smith		36 09		
H. Miller	do St. Joseph's Island		86 00		
Thomas English	do Somerville		20 00		
R. C. Smith	do do		25 95		
J. M. Machar	do Torrington		92 50		

T. D. Ledyard	do	Snowden		20 00	
Jacob Flick	do	"A" Walsingham		7 00	
G. Livingstone	do	Wicklow		50 00	
Bond & Kellogg	Refund of timber dues			49 20	
Bank of Toronto	do			68 15	
Croft, Wm	do			206 15	
Dominion Bank	do			156 60	
Green, P. J	do	Wicklow		179 09	
Grey, John	do			72 00	
Gaebel, Henry	do	Dungannon		34 23	
Ince, T. H	do			100 00	
Lindsay, R	do	"A" Anson		45 16	
McDavett, C	do	McClure		32 55	
McFadden, D	do	Digby		47 12	
McFarlane, D	do			63 92	
McLean, George	do	Dungannon		57 51	
Neil, W	do	Carlen		40 91	
Rathbun, H. B., & Son	do	Anglesea		115 30	
Sinclair, D	do	Snowden		16 00	
Bronson & Weston	Refund of fee			5 00	
Caswell, G., jr	do			1 00	
Jett, C. A	do			2 00	
Lawrence, Thomas	do			1 00	
McIntyre, W. H	do			1 00	
Scott, T.	Refund account, mining location			150 00	
Wilson, Adam	do	Part of cost of survey of Pine Island		20 00	
Treasurer of Ontario	do	Rent W½ 10, in 8 Brooke		46 95	
Minister of Interior	do	Dues *re* Indian Lands		104 39	
The Treasurer—					
Barrie	Refund for timber cut on road allowance			22 09	
Bangor, McClure and Wicklow	do			24 67	
Belmont and Methuen	do			15 92	
Burleigh, Anstruther and Chandos	do			76 85	
Cardiff	do			53 50	
Carlow and Mayo	do			3 91	
Clarendon and Miller	do			6 60	
Dalhousie, N. Sherbrooke and Lavant	do			2 70	
Denbigh, Abinger and Ashby	do			0 31	
Draper and Oakley	do			1 42	
Dungannon and Farraday	do			35 46	
Foley	do			8 81	
Galway and Cavandish	do			64 74	
Glamorgan and Monmouth	do			99 80	
Griffith & Mattawatchan	do			29 68	
	Carried forward			4,937 85	3,252 92	2,209,105 31

REFUNDS.—*Concluded.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		4,937 85	3,252 92	2,209,105 41
	CROWN LANDS.—*Continued.*				
The Treasurer—					
Harney	Refund for timber cut on road allowance		32 60		
Humphrey	do		21 53		
Kaladar and Anglesea	do		22 42		
Kennebec	do		40 46		
Laxton, Digby and Longford	do		4 58		
Lutterworth, Anson and Hindon	do		11 72		
Medora and Wood	do		9 12		
Minden	do		4 54		
Monteagle and Herschel	do		1 60		
McDougall	do		37 76		
McKellar	do		41 75		
McLean and Ridout	do		9 75		
Olden	do		46 91		
Oso	do		18 85		
Palmerston and South Canonto	do		20 45		
Ryde	do		152 62		
Sheffield	do		19 42		
Snowdon	do		56 03		
Stanhope	do		47 53		
Tudor Wollaston, Limerick and Cashel	do		37 38		
				5,574 87	
	MUNICIPALITIES FUND.				
Adelaide township	Apportionment in proportion to the number of ratepayers, 1879		23 87		
Adjala do	do do		20 62		
Admaston do	do do		13 75		
Adolphustown township	do do		6 20		
Albemarle do	do do		8 22		
Albion do	do do		32 90		
Aldborough do	do do		41 30		

Alfred	do	do	do		18	48	
Algona, South	do	do	do		3	92	
Alice	do	do	do		10	61	
Alnwick	do	do	do		8	33	
Amabel	do	do	do		19	39	
Amaranth	do	do	do		22	92	
Ameliasburgh	do	do	do		28	60	
Amherst Island	do	do	do		7	24	
Ancaster	do	do	do		32	90	
Anderdon	do	do	do		16	28	
Anglesea	do	do	do		1	19	
Arran	do	do	do		29	05	
Artemesia	do	do	do		30	31	
Arthur	do	do	do		24	25	
Ashfield	do	do	do		28	81	
Asphodel	do	do	do		17	04	
Assiginack	do	do	do		9	77	
Athol	do	do	do		17	95	
Augusta	do	do	do		48	22	
Acton village	do	do	do		7	42	
Ailsa Craig village		do	do		7	32	
Almonte	do	do	do		23	41	
Alliston	do	do	do		8	40	
Amhertsburg town		do	do		22	40	
Arkona village		do	do		5	74	
Arnprior	do	do	do		10	15	
Arthur	do	do	do		10	54	
Ashburnham village		do	do		10	36	
Aurora	do	do	do		13	65	
Aylmer	do	do	do		12	91	
Auson and Hindon		do	do		3	54	
Bagot and Blythfield tps.		do	do		6	72	
Bangor township		do	do		5	70	
Barrie	do	do	do		3	36	
Barton	do	do	do		23	07	
Bastard and Burgess tps.		do	do		34	82	
Bathurst township		do	do		22	40	
Bayham	do	do	do		41	79	
Bedford	do	do	do		12	53	
Belmont	do	do	do		11	41	
Bentinck	do	do	do		35	63	
Bertie	do	do	do		30	59	
Beverley	do	do	do		40	01	
Bexley	do	do	do		6	02	
Biddulph	do	do	do		23	80	
Binbrook	do	do	do		14	00	
Blandford	do	do	do		12	81	
Blanchard	do	do	do		25	27	
Blenheim	do	do	do		43	71	
Carried forward					1,052	60	8,827 79	2,209,105 31

REFUNDS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		1,052 60	8,827 79	2,209,105 31
	MUNICIPALITIES FUND.—*Continued*				
Bosanquet township	Apportionment in proportion to the number of ratepayers, 1879		26 60		
Brant do	do do		30 07		
Brantford do	do do		51 38		
Brighton do	do do		32 30		
Brock do	do do		38 29		
Bromley do	do do		12 50		
Brooke do	do do		25 48		
Brougham do	do do		3 50		
Bruce do	do do		29 57		
Brudenel and Lyndock tps.	do do		7 56		
Burford township	do do		40 78		
Burgess, North, township	do do		10 43		
Burleigh, Anstruther and Chandos townships	do do		12 53		
Beckwith township	do do		15 50		
Brunel do	do do		7 74		
Barrie town	do do		41 37		
Bath village	do do		4 65		
Bayfield do	do do		5 78		
Beamsville village	do do		5 28		
Belle River do	do do		4 41		
Belleville town	do do		74 90		
Berlin do	do do		29 62		
Blenheim village	do do		15 64		
Blyth do	do do		6 76		
Bobcaygeon do	do do		7 07		
Bolton do	do do		5 63		
Bothwell do	do do		8 82		
Bowmanville town	do do		31 66		
Bracebridge village	do do		7 91		
Bradford do	do do		8 94		
Brampton town	do do		36 02		
Brantford city	do do		65 62		
Brighton village	do do		12 04		

Brussels village	do	do		11 94		
Burlington do	do	do		8 61		
Caistor township	do	do		16 10		
Caledon do	do	do		37 62		
Caledonia do	do	do		10 05		
Cambridge do	do	do		10 08		
Camden do	do	do		21 84		
Camden, East, township	do	do		44 24		
Canboro' do	do	do		12 28		
Carden do	do	do		6 23		
Cardiff do	do	do		4 27		
Cardwell do	do	do		3 57		
Carlow and Mayo do	do	do		7 11		
Caradoc do	do	do		37 31		
Carrick do	do	do		36 54		
Cartwright do	do	do		19 28		
Cavan do	do	do		38 22		
Cayuga, North, do	do	do		20 13		
Cayuga, South, do	do	do		7 21		
Charlottenburgh do	do	do		38 29		
Charlotteville do	do	do		36 99		
Chatham do	do	do		46 31		
Chingnacousy do	do	do		40 98		
Clarence do	do	do		24 96		
Clarendon & Miller do	do	do		5 04		
Clarke do	do	do		41 30		
Clinton do	do	do		17 92		
Colborne do	do	do		19 81		
Colchester do	do	do		28 21		
Carnarvon do	do	do		5 07		
Collingwood do	do	do		35 00		
Cornwall do	do	do		31 08		
Cramahe do	do	do		27 41		
Crosby, North, do	do	do		13 26		
Crosby, South, do	do	do		16 80		
Crowland do	do	do		13 06		
Culross do	do	do		26 21		
Cumberland do	do	do		23 42		
Caledonia village	do	do		10 57		
Campbellford do	do	do		9 73		
Cannington do	do	do		7 63		
Carleton Place do	do	do		16 06		
Cayuga do	do	do		6 20		
Chatham town	do	do		60 37		
Chippewa village	do	do		6 06		
Clifford do	do	do		4 97		
Clifton do	do	do		15 92		
Clinton town	do	do		23 17		
Cobourg do	do	do		41 41		
Carried forward				2,813 19	8,827 79	2,209,105 31

REFUNDS.—*Continued.*

TO WHOM PAID.	SERVICE.			$ c.	$ c.	$ c.	$ c.
	Brought forward				2,813 19	8,827 79	2,209,105 31
	MUNICIPALITIES FUND.—*Continued.*						
Colborne village	Apportionment in proportion to the number of ratepayers, 1879				9 17		
Collingwood town	do	do			35 07		
Cornwall do	do	do			30 41		
Dalhousie, North, township	do	do					
Sherbrooke and Lavant do	do	do			15 40		
Dalton do	do	do			3 12		
Darling do	do	do			4 79		
Darlington do	do	do			40 15		
Dawn do	do	do			18 06		
Delaware do	do	do			13 61		
Denbigh, Abinger, and Ashby do	do	do			4 80		
Derby do	do	do			17 53		
Dereham do	do	do			36 51		
Dorchester, North do	do	do			31 36		
Dorchester, South do	do	do			17 78		
Douro do	do	do			19 21		
Dover, East and West Tps	do	do			26 74		
Downey township	do	do			27 72		
Draper and Oakley township	do	do			9 66		
Drummond do	do	do			21 35		
Dumfries, North do	do	do			27 30		
do South do	do	do			24 01		
Dummer do do	do	do			14 42		
Dungannon and Faraday tp.	do	do			7 84		
Dunn township	do	do			9 70		
Dunwich township	do	do			39 69		
Dysart, Dudley, Harcourt, Guilford, Harburn, Havelock, Burton, Eyre and Clyde townships	do	do			7 10		
Drayton village	do	do			5 60		
Dresden do	do	do			14 07		
Dundas do	do	do			29 16		
Dunnville do	do	do			13 44		
Durham town	do	do			8 36		

Easthope, North, township..	do	do		22 75		
do South do ..	do	do		16 28		
Eastnor, Lindsay and St. Edmunds townships	do	do		8 68		
Edwardsburgh township	do	do		41 96		
Egremont do	do	do		25 27		
Ekfrid do	do	do		23 87		
Elderslie do	do	do		26 22		
Eldon do	do	do		27 47		
Elizabethtown do	do	do		47 22		
Ellice do	do	do		23 97		
Elma do	do	do		27 16		
Elmsley, North do	do	do		9 66		
do South do	do	do		8 68		
Elzevir and Granthorpe tps..	do	do		11 13		
Emily township	do	do		23 59		
Enniskillen township	do	do		25 52		
Ennismore do	do	do		6 40		
Eramosa do	do	do		23 17		
Erin do	do	do		35 35		
Earnestown do	do	do		37 59		
Escott Front do	do	do		7 53		
Esquesing do	do	do		36 29		
Essa do	do	do		32 48		
Etobicoke do	do	do		21 04		
Euphemia do	do	do		21 77		
Euphrasia do	do	do		26 32		
Elora village	do	do		10 71		
Embro do	do	do		4 72		
Exeter do	do	do		16 03		
Fenelon township	do	do		24 99		
Finch do	do	do		20 55		
Fitzroy do	do	do		20 51		
Flamborough, East, township	do	do		21 38		
do West do	do	do		26 32		
Flos do	do	do		17 19		
Foley do	do	do		5 32		
Fredericksburgh, North, do..	do	do		18 20		
do South do..	do	do		11 20		
Fullarton township	do	do		22 26		
Fort Erie village..	do	do		7 04		
Fergus do	do	do		12 03		
Fenelon Falls village	do	do		9 70		
Forest do	do	do		12 07		
Gainsborough township	do	do		23 03		
Galway and Cavendish do..	do	do		5 46		
Garafraxa, East do..	do	do		18 94		
do West do..	do	do		27 44		
Georgina do..	do	do		14 03		
Carried forward				4,353 81	8,827 79	2,209,105 31

REFUNDS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		4,353 81	8,827 79	2,209,105 31
	MUNICIPALITIES FUND.—*Continued.*				
Glamorgan and Monmouth	Apportionment in proportion to the number of ratepayers, 1879		8 58		
Glanford township	do do		17 32		
Glenelg do	do do		31 01		
Gloucester do	do do		49 35		
Goderich do	do do		27 23		
Gordon do	do do		7 39		
Gosfield do	do do		28 66		
Goulburn do	do do		19 88		
Gower, North, township	do do		19 29		
do South, township	do do		8 82		
Grantham do	do do		18 16		
Greenock do	do do		25 41		
Grattan do	do do		10 99		
Grey do	do do		35 70		
Griffith and Matawatchan tps	do do		3 47		
Grimsby township	do do		21 03		
Guelph do	do do		16 84		
Gwillimbury, East, township	do do		37 17		
do North, do	do do		16 52		
do West, do	do do		21 04		
Galt, town	do do		38 61		
Gananoque village	do do		21 74		
Garden Island do	do do		3 54		
Georgetown do	do do		12 04		
Gravenhurst do	do do		5 42		
Glencoe do	do do		6 76		
Goderich town	do do		62 40		
Grimsby village	do do		5 50		
Guelph city	do do		84 73		
Hagarty, Sherwood, Jones, Richards and Burns tps	do do		10 40		
Haldimand township	do do		41 72		
Hallowell do	do do		35 91		
Hamilton do	do do		41 75		
Harwich do	do do		47 74		

Harvey do	do	do		8 12		
Hawkesbury, East, township	do	do		29 23		
do West, do	do	do		16 90		
Hay do	do	do		29 23		
Head, Clara and Maria tps.	do	do		1 89		
Herchell and Monteagle do	do	do		7 70		
Hibbert township	do	do		19 46		
Hillier do	do	do		18 13		
Hinchinbrooke township	do	do		9 52		
Holland do	do	do		26 28		
Hope do	do	do		38 47		
Horton do	do	do		8 75		
Houghton do	do	do		15 68		
Howard do	do	do		36 75		
Howe Island do	do	do		2 90		
Howick do	do	do		32 87		
Howland do	do	do		6 47		
Hallett do	do	do		30 80		
Humberstone do	do	do		25 34		
Humphrey do	do	do		6 02		
Hungerford do	do	do		33 92		
Huntingdon do	do	do		22 05		
Huntley do	do	po		15 71		
Huron do	do	do		28 81		
Hamilton city	do	do		310 94		
Harriston village	do	do		12 21		
Hastings do	do	do		5 22		
Hawkesbury village	do	do		10 22		
Hespeler do	do	do		5 14		
Holland Landing village	do	do		5 11		
Innisfil township	do	do		46 97		
Ingersol town	do	do		46 97		
Iroquois village	do	do		7 11		
Kaladar township	do	do		5 74		
Kenebec do	do	do		6 47		
Kenyon do	do	do		28 25		
Keppel do	do	do		28 84		
Kincardine do	do	do		29 05		
King do	do	do		51 73		
Kingston do	do	do		37 94		
Kinloss do	do	do		20 93		
Kitley do	do	do		21 98		
Kemptville village	do	do		10 18		
Kincardine do	do	do				
Kingston city	do	do		160 16		
Kingsville village	do	do		5 74		
Lake township	do	do		1 54		
Lanark do	do	do		15 40		
Lancaster do	do	do		34 02		
Carried forward				6,589 79	8,827 79	2,209,105 31

REFUNDS.—*Continued.*

TO WHOM PAID.	SERVICE.		$ c.	$ c.	$ c.	$ c.
	Brought forward			6,589 79	8,827 79	2,209,105 31
	MUNICIPALITIES FUND.—*Continued.*					
Laxton, Digby and Longford townships	Apportionment in proportion to the number of ratepayers, 1879			5 85		
Leeds and Landsdowne, Front, township	do	do		28 21		
Leeds and Landsdowne, Rear, township	do	do		22 99		
Lobo township	do	do		28 74		
Lochiel do	do	do		28 56		
Logan do	do	do		23 17		
Longueil do	do	do		8 54		
London do	do	do		81 62		
Loughborough township	do	do		16 73		
Louth do	do	do		15 40		
Luther do	do	do		27 30		
Lutterworth do	do	do		3 67		
Lakefield village	do	do		7 70		
Lanark do	do	do		4 80		
Leamington do	do	do		9 66		
Lindsay town	do	do		35 52		
Listowel village	do	do		22 89		
London city	do	po		198 10		
London, East, village	do	do		36 37		
L'Original do	do	do		4 09		
Lucan do	do	do		8 26		
Lucknow do	do	do		8 79		
Macaulay do	do	do		8 54		
Madoc do	do	do		6 12		
Maidstone do	do	do		23 28		
Malahide do	do	do		38 60		
Malden do	do	do		10 43		
Manvers do	do	do		26 81		
Mara do	do	do		25 45		
March do	do	do		7 63		
Mariposa do	do	do		48 12		
Markham do	do	do		47 95		
Marlborough do	do	do		14 35		
Marmora do	do	do		13 69		

Maryborough	do	do	do	28 24		
Marysburg, N.	do	do	do	14 84		
do S.	do	do	do	18 59		
Matilda	do	do	do	34 40		
Medonte	do	do	do	24 85		
Medora and Wood		do	do	6 02		
Melancthon township		do	do	19 53		
Mersea	do	do	do	21 74		
Metcalf	do	do	do	15 29		
Methorn	do	do	do	1 23		
Middleton	do	do	do	27 26		
Minden	do	do	do	8 09		
Minto	do	do	do	31 50		
Monaghan, N.	do	do	do	8 71		
do S.	do	do	do	6 86		
Monk	do	do	do	6 27		
Mono	do	do	do	22 71		
Montague	do	do	do	20 51		
Moore	do	do	do	43 68		
Mornington	do	do	do	27 02		
Morris	do	do	do	24 15		
Morrison	do	do	do	4 97		
Mosa	do	do	do	16 00		
Moulton	do	do	do	15 82		
Mountain	do	do	do	26 46		
Mulmer	do	do	do	26 56		
Murray	do	do	do	31 75		
Muskoka	do	do	do	6 51		
McDougal	do	do	do	7 38		
McGillivray	do	do	do	31 85		
McKellar	do	do	do	4 69		
McKillop	do	do	do	29 93		
McLean and Ridout, tps		do	do	7 94		
McNab township		do	do	20 51		
Madoc village		do	do	6 13		
Markham do		do	do	6 54		
Meaford do		do	do	14 25		
Merrickville village		do	do	7 38		
Merritton	do	do	do	15 58		
Midland	do	do	do	3 78		
Millpoint	do	do	do	7 66		
Milton town		do	do	11 31		
Mitchell do		do	do	19 60		
Morrisburgh village		do	do	12 46		
Mount Forest do		do	do	14 21		
Nassagaweya township		do	do	20 65		
Nelson	do	do	do	30 97		
Nepean	do	do	do	50 54		
Niagara	do	do	do	20 58		
Carried forward				8,371 22	8,827 79	2,209,105 31

REFUNDS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		8,371 22	8,827 79	2,209,105 31
	MUNICIPALITES' FUND.—*Continued.*				
Nichol township	Apportionment in proportion to the number of ratepayers, 1879		18 94		
Nissouri, East do	do do		25 13		
do West do	do do		25 51		
Normanby do	do do		39 55		
Norwich, North do	do do		18 69		
do South do	do do		21 84		
Nottawasaga do	do do		45 29		
Napanee town	do do		27 90		
Newboro' village	do do		3 25		
Newburgh do	do do		7 39		
Newbury do	do do		4 76		
Newcastle do	do do		9 03		
New Edinburgh village	do do		7 59		
New Hamburgh do	do do		9 63		
Newmarket do	do do		15 40		
Niagara town	do do		12 53		
Norwich village	do do		9 17		
Norwood do	do do		6 68		
Oakland township	do do		8 96		
Olden do	do do		7 74		
Oneida do	do do		19 67		
Onondaga do	do do		11 16		
Ops do	do do		27 72		
Orford do	do do		27 55		
Orillia and Matchedash tp	do do		24 71		
Oro township	do do		31 04		
Osgoode do	do do		33 50		
Osnabruck township	do do		42 70		
Oso do	do do		6 93		
Osprey do	do do		24 53		
Otonabee do	do do		28 77		
Oxford do	do do		30 87		
Oxford, North do	do do		10 54		
do West do	do do		17 81		
do East do	do do		18 45		
Oakville village	do do		18 16		
Oilsprings do	do do		7 35		

Omemee do	do	do		7 11		
Orangeville town	do	do		24 60		
Orillia do	do	do		24 12		
Oshawa village	do	do		42 28		
Ottawa city	do	do		276 50		
Owen Sound town	do	do		40 60		
Packenham township	do	do		12 67		
Palmerston, and N. and S. Canonto township	do	do		6 26		
Peel do	do	do		39 59		
Pelee Island do	do	do		2 45		
Pelham do	do	do		24 29		
Pembroke do	do	do		4 83		
Percy do	do	do		24 25		
Petewawa do	do	do		4 17		
Pickering do	do	do		51 03		
Pilkington do	do	do		19 14		
Pittsburgh do	do	do		21 68		
Plantagenet, North, township	do	do		23 83		
do South do	do	do		16 07		
Plympton do	do	do		35 63		
Portland do	do	do		23 38		
Proton do	do	do		24 15		
Puslinch do	do	do		30 20		
Paisley village	do	do		9 84		
Palmerston town	do	do		16 10		
Paris do	do	do		29 93		
Parkdale village	do	do		5 56		
Parkhill do	do	do		14 07		
Pembroke town	do	do		21 35		
Penetanguishene village	do	do		7 32		
Perth town	do	do		32 90		
Peterborough town	do	do		65 80		
Petersville village	do	do		12 98		
Petrolia do	do	do		21 95		
Picton do	dd	do		26 49		
Point Edward village	do	do		7 98		
Port Colborne do	do	do		16 59		
Port Dalhousie do	do	do		9 07		
Port Dover do	do	do		9 55		
Port Elgin do	do	do		11 31		
Port Hope town	do	do				
Port Perry village	do	do		15 61		
Port Stanley do	do	do		5 67		
Portsmouth do	do	do		6 72		
Prescott town	do	do		27 51		
Preston village	do	do		14 00		
Radcliffe and Raglan tp	do	do		5 53		
Rainham do	do	do		15 57		
Carried forward				10,268 89	8,827 79	2,209,105 31

REFUNDS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		10,268 89	8,827 79	2,209,105 31
	MUNICIPALITIES FUND.—*Continued.*				
Raleigh township..	Apportionment in proportion to the number of ratepayers, 1879		37 38		
Rama do	do do		8 89		
Ramsay do	do do		24 54		
Rawdon do	do do		30 31		
Reach do ...	do do		41 09		
Redmond do	do do		33 07		
Rochester do	do do		14 07		
Rolph, Buchanan, *et al* tps .	do do		4 94		
Romney township	do do		7 84		
Ross do	do do		12 14		
Roxborough do	do do		26 18		
Russell do	do do		19 88		
Ryde do	do do		4 48		
Renfrew village	do do		8 68		
Richmond do	do do		3 08		
Richmond Hill village .	do do		5 71		
Ridgetown do ...	do do		11 48		
Saltfleet township	do do		25 31		
Sandwich, East, township ..	do do		24 01		
do West do .	do do		21 98		
Sarawak do .	do do		7 95		
Sarnia do ..	do do		22 33		
Sangeen do .	do do		15 12		
Sault Ste. Marie do .	do do		12 32		
Scarborough do ..	do do		38 95		
Scott do ..	do do		21 32		
Scugog do ..	do do		4 23		
Sebastopol do ..	do do		4 17		
Seneca township	do do		22 71		
Seymour township	do do		26 74		
Sheffield do	do do		21 28		
Sherbrooke do	do do		3 85		
Sherbrooke, South, township.	do do		7 00		
Sidney do	do do		42 00		
Smith do	do do		24 08		

Snowdon do	do	do		6 16		
Sombra do	do	do		30 10		
Somerville do	do	do		10 32		
Sophiasburgh township	do	do		21 63		
Southwold do	do	do		43 68		
Stafford do	do	do		5 78		
Stamford do	do	do		21 66		
Stanhope and Sherborne township	do	do		4 17		
Stanley township	do	do		22 12		
Stephen do	do	do		31 46		
Stephenson township	do	do		8 93		
Stisted do	do	do		6 79		
Storrington do	do	do		17 43		
St. Vincent do	do	do		28 14		
Sullivan do	do	do		29 01		
Sunnidale do	do	do		17 12		
Sydenham do	do	do		30 55		
Sandwich town	do	do		10 26		
Sarnia do	do	do		35 03		
Sault Ste. Marie town	do	do		12 32		
Seaforth do	do	do		19 95		
Shelburne village	do	do		5 46		
Simcoe town	do	do		30 66		
Smith's Falls village	do	do		15 79		
Southampton do	do	do		8 15		
Springfield do	do	do		5 46		
Stayner do	do	do		9 80		
Stirling do	do	do		6 83		
Stouffville do	do	do		5 91		
Stratford town	do	do		61 92		
Strathroy do	do	do		31 85		
Streetsville village	do	do		5 25		
St. Catharines city	do	do		87 95		
St. Mary's town	do	do		26 70		
St. Thomas do	do	do		55 51		
Tay township	do	do		12 43		
Tecumseth township	do	do		36 75		
Thorah do	do	do		19 91		
Thorold do	do	do		25 10		
Thurlow do	do	do		49 87		
Tilbury, East do	do	do		17 78		
Tilbury, West do	do	do		22 75		
Tiny do	do	do		20 37		
Torbolton do	do	do		6 20		
Toronto do	do	do		48 30		
Toronto Gore	do	do		10 29		
Tossorontio township	do	do		9 83		
Townsend do	do	do		41 69		
Carried forward				11,999 12	8,827 79	2,209,105 31

REFUNDS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		11,999 12	8,827 79	2,209,105 31
	MUNICIPALITIES FUND.—*Continued.*				
Trafalgar township	Apportionment in proportion to the number of ratepayers, 1879		42 66		
Tuckersmith do	do do		24 85		
Tudor, Wollaston, Limerick, and Cashel townships	do do		11 20		
Turnberry township	do do		18 41		
Tyendinaga do	do do		35 39		
Teeswater village	do do		9 10		
Thamesville do	do do		6 40		
Thedford do	do do		5 36		
Thorold town	do do		28 17		
Tilsonburgh town	do do		20 34		
Tiverton do	do do		4 44		
Toronto city	do do		878 50		
Trenton village	do do		20 23		
Usborne township	do do		23 45		
Uxbridge do	do do		31 64		
Uxbridge village	do do		13 86		
Vaughan township	do do		49 18		
Verulam do	do do		17 99		
Vespra do	do do		25 76		
Vienna village	do do		6 19		
Wainfleet township	do do		24 99		
Wallace do	do do		21 91		
Walpole do	do do		41 56		
Walsingham do	do do		44 27		
Warwick do	do do		31 29		
Waterloo do	do do		41 54		
Watt do	do do		7 35		
Wawanosh, east, township	do do		15 85		
Wawanosh, west, do	do do		21 11		
Wellesley do	do do		37 97		
Westmeath do	do do		19 99		
Westminster do	do do		70 70		
Whitby, east do	do do		33 67		
Whitby, west do	do do		28 59		

Whitchurch	do	do	do		39 28		
Wilberforce	do	do	do		15 30		
Williams, east	do	do	do		17 46		
Wiliams, west	do	do	do		16 00		
Williamsburgh	do	do	do		29 50		
Willoughby	do	do	do		9 98		
Wilmot	do	do	do		38 04		
Winchester	do	do	do		34 76		
Windham	do	do	do		40 49		
Wolfe Island	do	do	do		18 10		
Wolford	do	do	do		17 29		
Woodhouse	do	do	do		23 73		
Woolwich	do	do	do		36 61		
Walkerton town		do	do		20 93		
Wallaceburgh village		do	do		12 95		
Wardsville	do	do	do		3 60		
Waterdown	do	do	do		7 91		
Waterford	do	do	do		8 68		
Waterloo town		do	do		17 08		
Watford village		do	do		6 18		
Welland town		do	do		23 66		
Wellington village		do	do		4 90		
Whitby town		do	do		24 11		
Windsor	do	do	do		59 22		
Wingham village		do	do		15 41		
Woodstock	do	do	do		41 58		
Wroxeter	do	do	do		4 41		
Wyoming	do	do	do		6 96		
Yarmouth township		do	do		62 09		
Yonge Front	do	do	do		13 27		
Yonge and Escott Rear tps		do	do		20 12		
York township		do	do		109 24		
Yorkville village		do	do		35 70		
Zone township		do	do		11 76		
Zorra, East, township		do	do		29 61		
do West,	do	do	do		25 20		
						14,617 47	

LAND IMPROVEMENT FUND.

Artemesia	Allowance under 16 Vic., cap. 159, from proceeds Crown Lands		129 15			
Admaston	do	do	20 68			
Alfred	do	do	19 79			
Amaranth	do	do	16 41			
Arthur	do	do	71 13			
Barrie	do	do	38 48			
Brudenell	do	do	0 82			
Bromley	do	do	31 08			
Belmont	do	do	6 25			
	Carried forward		333 79		23,445 26	2,209,105 31

REFUNDS.—*Continued.*

TO WHOM PAID.	SERVICE.		$ c.	$ c.	$ c.	$ c.
	Brought forward		333 79		23,445 26	2,209,105 31
	LAND IMPROVEMENT FUND.—*Continued.*					
Carrick	Allowance under 16 Vic., cap. 159, from proceeds Crown Lands		54 97			
Culross	do	do	92 09			
Collingwood	do	do	22 53			
Carden	do	do	75 26			
Digby	do	do	21 54			
Elzivir	do	do	21 42			
Elma	do	do	21 20			
Eldon	do	do	8 70			
Greenock	do	do	118 14			
Galway	do	do	10 17			
Garafraxa	do	do	2 38			
Hichinbrooke	do	do	4 68			
Holland	do	do	86 91			
Howick	do	do	45 16			
Kinloss	do	do	138 56			
Leeds	do	do	27 58			
Laxton	do	do	79 36			
Luther	do	do	249 78			
Melancthon	do	do	156 92			
Marmora	do	do	47 54			
Muskoka	do	do	8 71			
McNab	do	do	10 53			
Minto	do	do	116 78			
Oso	do	do	57 24			
Osprey	do	do	349 35			
Paisley (village)	do	do	13 91			
Preton	do	do	9 40			
Penetanguishene	do	do	16 26			
Ross	do	do	0 47			
Somerville	do	do	2 52			
St. Joseph's Island	do	do	24 29			
Wallace	do	do	60 26			
Westmeath	do	do	10 72			
				2,202 12		

Arran	Allowance under 16 Vic., cap. 159, from proceeds of Common School Lands		452 86			
Ashfield	do	do	136 50			
Arthur	do	do	187 69			
Brant	do	do	232 99			
Bruce	do	do	1,698 69			
Bentick	do	do	173 17			
Derby	do	do	82 04			
Elderslie	do	do	739 57			
Egremont	do	do	811 07			
Elma	do	do	32 40			
Glenelg	do	do	497 59			
Grey	do	do	76 95			
Huron	do	do	885 42			
Holland	do	do	82 14			
Kincardine	do	do	409 47			
Kinloss	do	do	268 52			
Morris	do	do	72 73			
Normanby	do	do	276 35			
Sangeen	do	do	366 15			
Sullivan	do	do	569 77			
Sydenham	do	do	111 09			
Turnberry	do	do	209 36			
Wawanosh, E.	do	do	113 07			
Wallace	do	do	264 87			
				8,750 46		
Proton	Allowance under 16 Vic., cap. 159, from proceeds Grammar School Lands			160 39		
					11,112 97	
	Total Refunds					34,558 23
	Total Expenditure under Supply Bill					2,243,663 54

RAILWAY SUBSIDY FUND.

(Authority for payment, 35 Vic. cap. 24, and 37 Vic., cap. 37.)

Canada Southern	On account of grant in aid of lines from St. Clair Junction to St. Thomas—62.901 miles.					
	Payments due 30th June, 1880		6,113 98			
	do 31st December, 1880		6,113 98			
				12,227 96		
	Carried forward			12,227 96		2,243,663 54

AID TO RAILWAYS.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		12,227 96		2,243,663 54
	RAILWAY SUBSIDY FUND.—*Continued.*				
Toronto, Grey and Bruce Railway	On account of grant in aid of lines from Orangeville to Owen Sound, and Toronto to Weston 82·079 miles.				
	Payments due 30th June, 1880	4,404 56			
	do 31st December, 1880	4,404 56			
			8,809 12		
Midland Railway	On account of grant in aid of line from Orillia to Midland Bay 34·13 miles.				
	Payments due 30th June, 1880	3,732 11			
	do 31st December, 1880	3,732 11			
			7,464 22		
London, Huron and Bruce Railway.	On account of grant in aid of line from London Junction to Wingham Junction 69·146 miles.				
	Payments due 30th June, 1880	6,720 99			
	do 31st December, 1880	6,720 99			
			13,441 98		
Brantford, Norfolk and Port Burwell Railway.	On account of grant in aid of line from Brantford to Tilsonburg 33·27 miles.				
	Payments due 30th June, 1880	3,233 84			
	do 31st December, 1880	3,233 84			
			6,467 68		
Credit Valley Railway	On account of grant in aid of line from Toronto to Brock Road and Streetsville to Alton				
	Payments due 30th June, 1880	8,684 46			
	do 31st December, 1880	8,684 46			
			17,368 92		
Grand Junction Railway	On account of grant in aid of line from Stirling to Hastings 24·32 miles				
	Payments due 30th June, 1880	2,104 16			
	do 31st December, 1880	2,104 16			
			4,208 32		
Prince Edward County Railway.	On account of grant in aid of line from Picton to Trenton 32 miles.				
	Payments due 30th June, 1880	3,888 00			
	do 31st December, 1880	3,888 00			
			7,776 00		

Victoria Railway	On account of grant in aid of line from Lindsay to Kinmount—33·442 miles.				
	Payments due 30th June, 1880	4,875 84			
	do 31st December, 1880	4,875 84			
			9,751 68		
Hamilton and North-western Railway.	On account of grant in aid of line from Hamilton to Barrie and Clarksville to Collingwood—117·098 miles.				
	Payments due 30th June, 1880	17,415 92			
	do 31st December, 1880	17,415 92			
			34,831 84		
				122,347 72	
	(Authority for payment, 40 Vic. cap. 14.)				
Victoria Railway	On account of grant in aid of line from Kinmount to Haliburton—22·31 miles.				
	Payments due 30th June, 1880	7,721 04			
	do 31st December, 1880	7,721 04			
			15,442 08		
Credit Valley Railway	On account of grant in aid of line from Toronto to Ingersoll, Streetsville to Alton, and Cataract to Elora—151·851 miles.				
	Payments due 30th June, 1880	6,569 07			
	do 31st December, 1880	6,569 07			
			13,138 14		
Whitby and Port Perry Railway.	On account of grant in aid of line from Port Perry to Lindsay—25·945 miles.				
	Payments due 30th June, 1880	2,244 76			
	do 31st December, 1880	2,244 76			
			4,489 52		
Prince Arthur's Landing Railway.	On account of grant in aid of line from Prince Arthur's Landing to Fort William—5·995 miles.				
	Payments due, 30th June, 1880	518 68			
	do 31st December, 1880	518 68			
			1,037 36		
				34,107 10	
	AID TO RAILWAYS.				
	(Authority for payment—39 Vic., cap. 22; and 42 Vic., cap. 28.)				
Credit Valley Railway	On account of grant in aid of line from Brock Road to Ingersoll and Cataract to Elora—				
	Payments due 30th June, 1880	4,499 04			
	do 31st December, 1880	4,499 04			
			8,998 08		
Belleville and North Hastings Railway	On account of grant in aid of line from Grand Junction Railway to Moore Mine—22 miles.				
	Payments due 30th June, 1880	2,855 16			
	do 31st December, 1879	2,855 16			
			5,710 32		
	Carried forward		14,708 40		2,243,663.54

AID TO RAILWAYS—*Concluded.*—SURPLUS DISTRIBUTION FUND.

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward		14,708 40		2,243,663 54
	AID TO RAILWAYS.—*Continued.*				
	(Authority for payment—39 Vic., cap. 22; and 42 Vic., cap. 28).				
Grand Junction Railway	On account of grant in aid of line from Stirling to Hastings—24·32 miles.				
	Payments due 30th June, 1880	1,052 08			
	do 31st December, 1880	1,052 08			
			2,104 16		
				16,812 56	
	(Authority for payment—41 Vic. cap. 16.)				
Hamilton and North-Western Railway	On account of grant in aid of line from Jarvis to Port Dover—8,975 miles.				
	Payments due 30th June, 1880	776 51			
	do 31st December, 1880	776 51			
			1,553 02		
North Simcoe Railway	On account of grant in aid of line from Penetanguishene to Harrison's Crossing—33·343 miles.				
	Payments due 30th June, 1880	3,606 04			
	do 31st December, 1880	3,606 01			
			7,212 08		
				8,765 10	
	Total aid to Railways				182,032 48
	SURPLUS DISTRIBUTION FUND.				
	(Authority for payment—36 Vic. cap. 47.)				
Bastard and Burgess township	On account of appointments under Municipal Loan Fund Act			354 00	
Bertie do	do do			2,905 82	
Burford do	do do			729 02	

Bonnchere, sub. div., and Madawaska, East, tp	do	do				1,523 49	
Charlottenburg do	do	do				400 00	
Crosby, North, do	do	do				487 70	
Elora Village	do	do				854 41	
Etobicoke township	do	do				1,867 79	
Gower, S., do	do	do				79 00	
Hawkesbury, E., township	do	do				320 00	
Hespeller village	do	do				1,608 63	
Louth township	do	do				500 00	
March do	do	do				200 00	
Markham do	do	do				2,290 00	
Mount Forest village	do	do				1,698 94	
Nassagaweya township	do	do				892 50	
Portsmouth village	do	do				100 00	
Tilbury, W., township	do	do				4,351 86	
Vienna do	do	do				498 85	
Woolwich do	do	do				400 00	
	Total Surplus Distribution						22,061 41

DRAINAGE DEBENTURES FUND.

(Authority for payment—36 Vic. cap. 39, and 37 Vic. cap. 20.)

The Treasurer—							
Brant	Debentures issued to provide for Construction of Drainage Works				3,600 00		
Brooke	do	do			1,064 00		
Bosanquet	do	do			990 00		
Bruce	do	do			800 00		
Dorchester, South	do	do			2,240 00		
Ekfrid	do	do			744 00		
Grey	do	do			1,500 00		
Howick	do	do			2,664 90		
Keppel	do	do			368 62		
Logan	do	do			12,482 10		
Malahide	do	do			400 00		
Maraposa	do	do			2,353 58		
Ops	do	do			100 00		
Raleigh	do	do			1,689 60		
Richmond	do	do			2,500 00		
Rochester	do	do			2,069 00		
Thurlow	do	do			4,225 00		
Willoughby	do	do			794 00		
	Carried forward				40,584 80		2,447,757 43

DRAINAGE DEBENTURE FUND.—*Continued.*

TO WHOM PAID.	SERVICE.	$ c.	$ c.	$ c.	$ c.
	Brought forward			40,584 80	2,147,757 43
	DRAINAGE DEBENTURE FUND.—*Continued.*				
	Authority for payment—36 Vic. cap. 39, and 37 Vic. cap. 20.				
Brooke	Tile drainage			200 00	
Dunwich	do			2,600 00	
Howard	do			500 00	
Ops	do			700 00	
Plympton	do			1,000 00	
Southwold	do			5,394 50	
Warwick	do			300 00	
	Total Drainage				51,279 30
	NEW PARLIAMENT BUILDINGS.				
	(Authority for payment—43 Vic., cap. 2.)				
Gordon & Helliwell	Plans			2,000 00	
F. X. Berlinquet	do			1,000 00	
D. Ewart	do			500 00	
Hon. C. F. Fraser	Travelling expenses			16 00	
Sundry Newspapers	Advertising			509 31	
G. T. Railway	Freight			3 53	
Express Company	Charges			3 20	
P. Scully	Services as foreman			25 00	
L. Glynn	Services as labourer			8 44	
J. Herdman	do			9 69	
P. Aylward	do			9 69	
J. Shannan	do			8 12	

D. Murnene	do			9 69	
T. Lawlor	do			6 25	
T. McGolding	do			8 12	
T. Lynch	Services as caretaker of plans			42 00	
					4,150 07
	COMMON SCHOOL FUND.				
Treasurer, Quebec	On account of interest				15,000 00
	Total Expenditure				2,518,186 80

PROVINCIAL AUDITOR'S OFFICE,
TORONTO, January 31st, 1881.

C. H. SPROULE,
Auditor.

No. 14.

A STATEMENT shewing the Estimates for the year 1880, the amount expended by the Government of Ontario, and the amounts unexpended and over-expended to 31st December, 1880.

SERVICE.	SUB-HEAD OF SERVICE.	Appropriation.	Expenditure.	Unexpended.	Over-expended.
		$ c.	$ c.	$ c.	$ c.
I. Civil Government	Government House	5,580 00	7,116 30		1,536 30
	Lieutenant-Governor's Office salaries	2,400 00	2,700 00		300 00
	do expenses	950 00	950 00		
	Executive Council and Attorney-General's Office—salaries	11,350 00	11,350 00		
	do do expenses	3,120 00	3,059 11	50 89	
	Education Office—salaries	18,275 00	17,716 33	558 67	
	do expenses	2,525 00	3,038 41		513 41
	Crown Lands Department—salaries	35,450 00	34,891 83	558 17	
	do expenses	9,500 00	8,837 92	662 08	
	Public Works Department—salaries	15,852 00	15,460 75	391 25	
	do expenses	3,320 00	2,642 14	677 86	
	Treasurer's Office—salaries	12,150 00	12,150 00		
	do expenses	2,000 00	2,957 03		957 03
	do East Wing, P. B., maintenance	3,300 00	4,059 86		759 86
	Secretary and Registrar's Department—salaries	11,150 00	11,154 22		4 22
	do do expenses	1,900 00	2,118 83		218 83
	do Registrar-General's Branch—salaries	4,800 00	4,800 00		
	do do expenses	2,925 00	2,950 51		25 51
	do License and Administration of Justice Branch—salaries	4,400 00	4,400 00		
	do do expenses	450 00	485 91		35 91
	Agricultural Office—salaries	1,000 00	1,000 00		
	do expenses	400 00	214 99	185 01	
	Immigration Office—salaries	1,200 00	1,200 00		
	do expenses	200 00	378 00		178 00
	Office of Inspector of Public Institutions—salaries	5,950 00	5,989 99		39 99
	do do expenses	1,500 00	2,025 24		525 24
	Miscellaneous :—				
	Official Gazette	4,200 00	3,338 82	861 18	
	Queen's Printer's Office	1,800 00	1,854 15		54 15
	Inspection of Registry Offices	1,500 00	1,500 00		
	do Division Courts	1,800 00	2,020 51		220 51
	do Insurance Companies	3,000 00	436 79	2,563 21	
	do County Offices	350 00	25 00	325 00	
	General Clerk of Works, etc	1,200 00	900 00	300 00	

Legislation	Salaries	11,150 00	10,700 00	450 00	
	Sessional Writers, &c	7,000 00	7,933 60		933 60
	Postages, &c	3,000 00	2,266 69	733 31	
	Stationery, Printing, &c	18,000 00	17,798 37	201 63	
	Printing Bills and distributing Statutes	3,000 00	2,933 05	66 95	
	Library	3,000 00	3,462 42		462 42
	Indemnity to Members	55,000 00	54,699 80	300 20	
	Repairs, Fuel, Light, &c	5,650 00	6,449 88		799 88
	Expenses	3,000 00	5,341 63		2,341 63
Administration of Justice	Superior Judges and Court of Appeal—salaries	15,500 00	15,525 00		25 00
	do do expenses	800 00	722 14	77 86	
	Court of Chancery—salaries	18,750 00	18,760 96		10 96
	do expenses	1,845 00	1,657 19	187 81	
	Court of Queen's Bench—salaries	9,020 00	9,020 00		
	do expenses	600 00	290 55	309 45	
	Court of Common Pleas—salaries	5,060 00	5,060 00		
	do expenses	250 00	180 65	69 35	
	Practice Court	1,850 00	1,836 88	13 12	
	Surrogate Court	2,020 00	2,060 40		40 40
	Clerk of Assize	1,030 00	1,028 72	1 28	
	Crown Counsel Prosecutions	10,600 00	9,674 74	325 26	
	General Administration of Criminal Justice in Counties	150,000 00	130,919 80	19,080 20	
	Special Services	4,000 00	3,164 13	835 87	
	Miscellaneous Justice :				
	D. C. C. & P.—salaries	16,000 00	15,950 00	50 00	
	District of Algoma	7,675 00	7,818 73		143 73
	do Thunder Bay	8,850 00	7,184 63	1,665 37	
	do Nipissing	4,100 60	4,685 15		585 15
	do Parry Sound	2,400 00	2,456 98		56 98
	do Muskoka	2,300 00	2,269 03	30 97	
	do Haliburton	1,700 00	1,443 75	256 25	
	Provincial Police	5,000 00	4,355 04	644 96	
	Attendance at Courts of Sheriff's D. C. C. & Pleas, &c	6,000 00	5,203 14	796 86	
	Seals and other Contingencies	300 00	303 14		3 14
	District Registration Books	200 00	101 00	99 00	
	Osgoode Hall, Fuel Light, Repairs	4,250 00	4,789 93		539 93
	Short Hand Reporters	7,000 00	7,075 00		75 00
	Expenses of County Judges in Grouped Counties	1,100 00	1,533 63		433 63
	Carried forward		550,388 42	33,329 02	11,820 44

Statement, &c—*Continued.*

SERVICE.	SUB-HEAD OF SERVICE.	Appropriation.	Expenditure.	Unexpended.	Over-expended.
		$ c.	$ c.	$ c.	$ c.
	Brought forward	.....	550,388 42	33,329 02	11,820 44
Education	Public and Separate Schools	240,000 00	239,954 13	45 87	
	do Inspection	29,630 00	29,478 97	151 03	
	Poor Schools	13,500 00	13,500 00		
	High Schools	83,000 00	82,904 85	95 15	
	do Inspection	7,400 00	7,356 50	43 50	
	Departmental Examinations	7,600 00	9,375 52		1,775 52
	Training Teachers	19,539 10	19,331 49	207 61	
	Superannuated Teachers	42,400 00	42,396 00	4 00	
	Normal School, Toronto, salaries	19,050 00	18,975 00	75 00	
	do do expenses	2,925 00	3,942 99		1,017 99
	do Ottawa, salaries	8,571 00	9,229 94		658 94
	do do expenses	3,600 00	4,546 14		946 14
	Museum	1,650 00	1,931 19		281 19
	Maps, etc.	12,000 00	12,142 29		142 29
	Depository, salaries	5,935 00	5,676 41	258 59	
	do expenses	2,466 83	2,480 50		13 67
	Miscellaneous	1,700 00	1,882 94		182 94
Institutions Maintenance	Asylum for Insane, Toronto	83,238 00	83,237 49	51	
	do London	103,962 00	100,185 58	3,776 42	
	do Kingston	55,214 00	55,195 79	18 21	
	do Hamilton	45,983 00	45,983 00		
	do Orillia	20,574 00	19,397 66	1,176 34	
	Central Prison	48,540 00	47,900 14	639 86	
	do Industries	13,530 00	14,169 83		639 83
	Reformatory Penitentiary	29,664 00	32,634 10		2,970 10
	Mercer Reformatory, Toronto	11,582 00	11,502 21	79 79	
	Institution for Deaf and Dumb	38,033 00	37,861 34	171 66	
	do Blind	30,139 00	30,138 97	03	
	School of Agriculture	23,750 00	21,987 80	1,762 20	
	do Practical Science	5,400 00	5,404 50		4 50

Immigration		51,450 00	52,982 19		1,532 19
Agriculture, Arts, Literary and Scientific Institutions		113,000 00	107,282 72	5,717 28	
Hospitals and Charities		72,832 63	72,832 63		
Miscellaneous	License Law	2,000 00		2,000 00	
	Expenses, &c.—Law Stamps and Licenses	1,500 00	477 14	1,022 86	
	do Marriage Licenses	400 00	166 75	233 25	
	Grant, &c., aid to Manufacturers	4,500 00	3,000 00	1,500 00	
	Grant—Ontario Rifle Association	600 00	600 00		
	Insurance	1,000 00	2,528 28		1,528 28
	Expenses of Elections	2,000 00	1,626 42	373 58	
	do Contested	1,000 00	1,732 35		732 35
	Revision of Voters' Lists	1,000 00	1,458 00		458 00
	Gratuities	36,374 83	35,407 59	967 24	
	Repairs, Brock's Monument	500 00		500 00	
	Aid to Sanitary Journal	800 00	800 00		
	Telephone Service	400 00	450 00		50 00
	Conveyance of Lunatics	5,250 00	2,170 62	3,079 38	
	Agricultural Commission	5,000 00	6,890 30		1,890 30
	Common Goal Alterations	2,232 50		2,232 50	
	Relief of Distress in Ireland	20,000 00	20,000 00		
	Expenses, *re* Territory Award	10,000 00	376 25	9,623 75	
Unprovided Items			13,609 49		13,609 49
Public Buildings	Asylum for Insane, Toronto	4,500 00	4,182 60	317 40	
	do do (Inspector)	5,715 00	5,712 64	2 36	
	do do London	2,200 00	2,006 18	193 82	
	do do (Inspector)	3,990 00	3,988 98	1 02	
	do do Hamilton	8,600 00	8,032 55	567 45	
	do do (Inspector)	3,600 00	3,600 00		
	do do Kingston	10,000 00	4,247 99	5,752 01	
	do do (Inspector)	3,900 00	3,900 71		0 71
	do do Orillia	400 00	2,439 40		2,039 40
	do do (Inspector)	625 00	316 00	309 00	
	Reformatory, Penetanguishene	15,000 00	12,918 89	2,081 11	
	do (Inspector)	10,254 88	10,254 88		
	Mercer Reformatory	14,014 00	13,977 78	36 22	
	Central Prison (Inspector)	1,650 00	1,885 58		235 58
	Deaf and Dumb Institute	1,000 00	175 85	823 15	
	do (Inspector	3,762 00	4,161 31		399 31
	Blind Institute	500 00		500 00	
	do (Inspector)	1,395 88	1,895 88		500 00
	School of Agriculture	24,000 00	21,797 03	2,202 97	
	Educational Buildings	1,650 00	1,567 10	82 90	
	Normal School, Ottawa	23,935 00	23,947 27		12 27
	Carried forward		2,016,492 04	81,954 04	43,438 43

Statement, &c.—*Continued.*

SERVICE.	SUB-HEAD OF SERVICE.	Appropriation.	Expenditure.	Unexpended.	Over-expended.
		$ c.	$ c.	$ c.	$ c.
	Carried forward		2,016,492 04	81,954 04	13,438 43
Public Buildings	School of Practical Science	4,359 00	4,292 48	66 52	
	Osgoode Hall	1,500 00	1,166 01	333 99	
	Government House	3,000 00	3,815 70		815 70
	Parliament Buildings	1,500 00	178 25	1,321 75	
	Public Buildings Algoma District	1,225 00	238 07	986 93	
	do Thunder Bay	1,500 00	650 99	849 01	
	do Muskoka and Parry Sound	2,800 00	10 00	2,790 00	
	do Nipissing	200 00		200 00	
	do New Territory	3,000 00		3,000 00	
	do				
Public Works	Muskoka River Works	7,800 00	7,232 29	567 71	
	Gull River Works	8,000 00	7,166 36	833 64	
	Mary's and Fairy Lakes Works	1,400 00	1,327 79	72 21	
	Otonabee River Works	2,000 00	1,877 13	122 87	
	Bridge at Des Joachims Rapids	4,000 00		4,000 00	
	Dam at Mountain Lake	1,500 00		1,500 00	
	Surveys, Inspections, &c.	5,000 00	1,198 67	3,801 33	
	Maintainance of Locks, &c.	7,700 00	7,573 07	126 93	
Colonization Roads		95,250 00	96,839 99		1,589 99
Charges on Crown Lands	Board of Surveyors	400 00	325 00	75 00	
	Agents' Salaries, &c	18,000 00	14,480 44	3,519 56	
	Forest Ranging	14,000 00	11,707 40	2,292 60	
	Surveys	40,600 00	32,533 63	8,066 37	

Refunds				2,252 92
Education	1,000 00	3,252 92		
Crown Lands	16,000 00	5,574 87		
Municipalities Fund	16,149 20	14,617 47	10,425 13	
Land Improvement Fund	11,112 98	11,112 97	1,531 73	
			61	
	2,324,063 83	2,243,663 54	128,437 33	48,097 04

C. H. SPROULE,
Auditor.

PROVINCIAL AUDITOR'S OFFICE,
TORONTO, January 31st, 1881

No. 15.

STATEMENT OF EXPENDITURE under vote for Unforeseen and Unprovided, being Expenditure in Excess of the Appropriations for different services for the year ended 31st December, 1880.

SERVICE.	SUB-SERVICE.	$ c.	$ c.	$ c.	$ c.
Civil Government	Government House		1,536 30		
	Lieutenant-Governor's Office—salaries		300 00		
	Education Office expenses		513 41		
	Treasurer's Office expenses		957 03		
	East Wing—maintenance		759 86		
	Secretary of Registrar's Department—salaries		4 22		
	do do expenses		218 83		
	Registrar-General's Branch—expenses		25 54		
	License and Administration of Justice Branch—expenses		35 91		
	Immigration Office expenses		178 00		
	Inspector of Public Institutions—salaries		39 99		
	do do expenses		525 24		
	Queen's Printer's Office		54 15		
	Inspector of Division Courts Office		220 51		
				5,368 99	
Legislation	Sessional Writers, etc		933 60		
	Library		462 42		
	Repairs, Fuel, Light, etc		799 88		
	Expenses		2,311 63		
				4,537 53	
Administration of Justice	Superior Judges and Court of Appeal		25 00		
	Court of Chancery—salaries		10 96		
	Surrogate Court		40 40		
	District of Algoma		143 73		
	do Nipissing		585 15		
	do Parry Sound		56 98		
	Seals, etc		3 14		
	Osgoode Hall Maintenance		539 93		
	Reporter's fund		75 00		
	Grouped Counties		433 63		
				1,913 92	
Education	Departmental Examinations		1,775 52		

	Normal School, Toronto expenses		1,017 99		
	do Ottawa Salaries		655 94		
	do do Expenses		946 14		
	Museum and Library		281 19		
	Depository Stock		142 29		
	Depository expenses		13 67		
	Miscellaneous		182 94		
Public Institutions Maintenance				5,015 68	
	Central Prison Industries		639 83		
	Reformatory, Penetanguishene		2,970 10		
	School of Practical Science		4 50		
				3,614 43	
Immigration				1,532 19	
Miscellaneous	Insurance on Public Buildings		1,528 28		
	Expenses Contested Elections		732 35		
	Revision of Voters' Lists		458 00		
	Telephone Service		50 00		
	Agricultural Commission		1,890 30		
	Unprovided Items		13,609 49		
				18,268 42	
Public Buiblings	Asylum for Insane, Kingston, furniture and furnishing, etc		71		
	do Orillia		2,039 40		
	Central Prison, furniture and furnishings, etc		235 58		
	Deaf and Dumb Institute, furniture and furnishings		399 31		
	Blind Institute, furniture and furnishings		500 00		
	Normal School, Ottawa		12 27		
	Government House		815 70		
				4,002 97	
Colonization Roads				1,589 99	
Refunds	Education			2,252 92	
	Total				48,097 04

PROVINCIAL AUDITOR'S OFFICE,
TORONTO, January 31st, 1881

C. H. SPROULE,
Auditor.

No. 16.

Comparative Statement of Expenditure during the years 1879 and 1880.

SERVICE.	SUB-SERVICE.	Expenditure, 1879.		Expenditure, 1880.	
		$ c.	$ c.	$ c.	$ c.
Civil Government	Lieutenant-Governor's Office—salaries	2,400 00		2,700 00	
	do. expenses	919 04		950 00	
	Government House	6,651 89		7,116 30	
	Attorney-General's Department—salaries	11,160 00		11,350 00	
	do. expenses	2,738 05		3,069 11	
	Education Department—salaries	18,275 00		17,716 33	
	do. expenses	3,656 06		3,038 41	
	Crown Lands Department—salaries	41,142 49		34,891 83	
	do. expenses	10,313 51		8,862 92	
	Public Works Department—salaries	15,143 66		15,460 75	
	do. expenses	2,487 31		2,642 14	
	Treasury Department—salaries	11,800 00		12,150 00	
	do. expenses	2,153 69		2,957 03	
	East Wing, Parliament Buildings—repairs, etc.	4,017 56		4,059 86	
	Secretary and Registrar's Office—salaries	11,474 50		11,154 22	
	do. expenses	1,859 85		2,118 83	
	Registrar-General's Office—salaries	4,800 00		4,800 00	
	do. expenses	1,782 31		2,950 54	
	License and Administration of Justice Branch—salaries	4,400 00		4,400 00	
	do expenses	510 43		485 91	
	Agricultural Office—salaries	800 00		1,000 00	
	do. expenses	173 89		214 99	
	Immigration Office—salaries	1,200 00		1,200 00	
	do. expenses	237 87		378 00	
	Inspection of Public Institutions—salaries	5,950 00		5,989 99	
	do. expenses	1,963 72		2,025 24	
	Miscellaneous—				
	Official Gazette	3,417 77		3,338 82	
	Queen's Printer's Office—salaries	1,560 00		1,700 00	
	do. expenses	16 30		154 15	
	Inspection of Registry Offices	1,500 00		1,500 00	
	do. Division Courts—salaries	1,400 00		1,400 00	
	do. do. travelling expenses	300 00		620 51	
	do. Insurance Companies			436 79	
	General Clerk of Works, etc.			900 00	
	Inspection of County Offices			25 00	
			154,276 84		173,732 67

Legislation	Official Salaries	10,525 00		10,700 00	
	Sessional writers, messengers, and pages	9,518 30		7,933 60	
	Postages and cost of House Post Office	2,509 43		2,266 69	
	Stationery, etc.	21,797 80		17,798 37	
	Printing, etc., Statutes	3,941 69		2,933 05	
	Indemnity to Members	54,031 00		54,699 80	
	Library	2,992 94		3,462 42	
	Contingencies	2,580 74		5,341 63	
	Repairs, fuel, light, etc	6,176 08		6,449 88	
			114,072 98		111,585 44
Administration of Justice	Court of Error and Appeal	16,004 11		16,247 14	
	Court of Chancery—salaries	18,651 02		18,760 96	
	do —expenses	1,315 31		1,657 19	
	Court of Queen's Bench—salaries	9,020 00		9,620 00	
	do expenses	605 86		290 55	
	Court of Common Pleas—salaries	5,060 00		5,060 00	
	do expenses	235 61		180 65	
	Practice Court	1,844 31		1,836 88	
	Surrogate Court	2,634 12		2,060 40	
	Office of Clerk of Assize	1,018 37		1,028 72	
	Crown Counsel Prosecutions	9,824 32		9,674 74	
	General Administration of Criminal Justice	141,065 15		130,919 80	
	Special services	1,627 49		3,164 13	
	Miscellaneous:—				
	Deputy Clerks of the Crown and Pleas—salaries	15,950 60		15,950 00	
	District of Algoma	7,945 08		7,818 73	
	do Thunder Bay	4,975 33		7,184 63	
	do Nipissing	3,116 93		4,085 15	
	do Parry Sound	2,355 17		2,456 98	
	do Muskoka	2,967 16		2,269 03	
	Provisional County of Haliburton	1,106 66		1,443 75	
	Provincial Police service at Clifton and Fort Erie	4,506 45		4,355 04	
	Sheriffs' fees, etc	5,883 42		5,203 14	
	Seals and other contingencies	70 40		303 14	
	District registration books	356 05		101 00	
	Light, Fuel, etc—Osgoode Hall	8,083 50		4,789 93	
	Expenses of County Judges re grouped counties	1,391 40		1,535 63	
	Assize Reporters	7,000 00		7,075 00	
			274,013 22		265,070 31
Education	Public and separate schools	239,081 00		239,954 13	
	do inspection	29,657 70		29,478 97	
	Poor schools	13,283 75		13,500 00	
	High Schools and Collegiate institutes	77,554 10		82,904 85	
	do inspection	7,929 17		7,356 50	
	Departmental examinations	10,992 25		9,375 52	
	Training of Teachers	14,428 18		19,331 49	
	Superannuated Teachers	43,774 50		42,396 00	
	Normal and Model Schools, Toronto—salaries	18,899 00		18,975 00	
	Carried forward		542,363 04		550,388 42

COMPARATIVE STATEMENT OF EXPENDITURE during the years 1879 and 1880.—*Concluded.*

SERVICE.	SUB-SERVICE.	EXPENDITURE, 1879.		EXPENDITURE, 1880.	
	Brought forward		542,363 04		550,388 42
Education	Normal and Model Schools, Toronto—expenses	3,753 65		3,942 99	
	Museum and Library	1,917 30		1,931 19	
	Depository—stock	22,015 33		12,142 29	
	do —salaries	5,904 59		5,675 41	
	do —expenses	2,516 05		2,480 50	
	Normal school, Ottawa—salaries	8,700 00		9,229 94	
	do —expenses	2,366 93		4,546 14	
	Miscellaneous	2,392 68		1,882 94	
Public Institutions, Maintenance	Asylum for insane, Toronto	79,281 86	527,097 24	83,237 49	505,104 86
	do London	93,610 43		100,185 58	
	do Kingston	51,455 58		55,195 79	
	do Hamilton	34,134 37		45,983 00	
	do idiots, Orillia	18,620 23		19,397 66	
	Reformatory, Penetanguishene	30,204 34		32,631 10	
	Central Prison, Toronto	48,104 80		47,900 14	
	do Industries	18,966 95		14,169 83	
	Mercer Reformatory, Toronto			11,502 21	
	Institution for Deaf and Dumb, Belleville	38,261 07		37,861 34	
	do Blind, Brantford	29,128 22		30,138 97	
	Agricultural College, Guelph	21,057 68		21,987 80	
	School of Practical Science, Toronto	6,365 27		5,404 54	
			469,190 80		505,598 41
Immigration			39,650 12		52,982 19
Agriculture, Arts, Literary and Scientific Institutions			105,900 80		107,282 72
Hospitals and Charities			73,720 44		72,832 63
Miscellaneous Expenses	Law stamps and licenses	868 34		477 14	
	Marriage licenses	331 95		166 75	
	Grant to manufacturers			3,000 00	
	Municipalities and other funds	821 17			
	Municipal loan fund	334 30			
	Arbitration—Ontario and Quebec				
	North-West Boundary	1,141 10		376 25	
	Ontario Rifle Association	600 00		600 00	

	Insurance—public buildings	20,671 65		2,528 28	
	Consolidation of Statutes	3,267 18			
	Expenses of elections	53,525 70		1,626 42	
	do contested elections	483 07		1,732 35	
	Revision of voters' lists	1,817 19		1,458 00	
	Gratuities	11,047 12		35,407 59	
	Aid to Sanitary Journal			800 00	
	Telephone service			450 00	
	Conveyance of Lunatics			2,170 62	
	Agricultural Commission			6,890 30	
	Relief Distress Ireland			20,000 00	
	Exhibition				
	Unprovided items	17,485 92		13,609 49	
	License law	856 95			
	Allowance to counties (30 Vic., cap. 31)	4,918 89			
	Sundry services	6,340 00			
			124,539 93		91,293 19
Public Buildings			140,190 90		141,361 12
Public Works			26,867 27		26,375 31
Colonization Roads			114,564 13		96,839 99
Crown Lands Expenditure			67,776 17		59,046 47
Refunds	Education	2,237 79		3,252 92	
	Crown Lands	15,567 21		5,574 87	
	Municipalities' Fund	21,177 03		14,617 47	
	Land Improvement Fund	14,439 23		11,112 97	
			53,421 26		34,558 23
Railway Subsidy Fund 35 and 37 Vict.			367,158 17		122,347 72
Railway Land Subsidy Fund 40 Vict.			52 091 61		34,107 10
Railway Aid (39 and 42 Vict.)			29,454 51		16,812 56
Railway Aid (41 Vict.)			20,359 73		8,765 10
Drainage Debentures Fund			86,602 39		51,279 30
Surplus Distribution Fund			65,765 76		22,061 41
New Parliament Buildings					4,150 07
Common School Fund			25,000 00		15,000 00
	Total		2,941,714 27		2,518,186 80

PROVINCIAL AUDITOR'S OFFICE,
TORONTO, January 31st, 1881.

C. H. SPROULE,
Auditor.

ESTIMATES

OF THE

PROVINCE OF ONTARIO,

FOR THE

FINANCIAL YEAR ENDING 31ST DECEMBER,

1881.

Toronto:
PRINTED BY C. BLACKETT ROBINSON, 5 JORDAN STREET.
1881.

SUMMARY

Of the estimated Expenditure of the Province of Ontario, for the Financial Year ending 31st December, 1881.

No.	SERVICES.	Page.	TO BE VOTED. For current expenditure.	On capital account.	For other purposes.
			$ cts.	$ cts.	$ cts.
I.	Civil Government	3	178,229 00		
II.	Legislation	9	108,900 00		
III.	Administration of Justice	10	280,990 00		
IV.	Education	14	505,025 73		
V.	Public Institutions, Maintenance	19	534,412 80		
VI.	Immigration	30	41,200 00		
VII.	Agriculture, Arts, Literary and Scientific Institutions.	31	106,750 00		
VIII.	Hospitals and Charities	32	78,141 98		
IX.	Miscellaneous Expenditure	32	50,273 73		
X.	Public Buildings—				
	(1) Repairs	33	14,000 00		
	(2) Capital account	33		111,241 00	
XI.	Public Works—				
	(1) Repairs	37	11,900 00		
	(2) Capital account	37		20,950 00	
XII.	Colonization Roads	38		96,500 00	
XIII.	Charges on Crown Lands	41	75,000 00		
XIV.	Refund account	42			45,677 49
XV.	Unforeseen and Unprovided	43	50,000 00		
	Total		2,034,823 24	228,691 00	45,677 49
	1. Current expenditure for 1881				2,034,823 24
	2. On capital account				228,691 00
	3. Other purposes				45,677 49
	Amount of Estimates				2,309,191 73

ESTIMATES OF EXPENDITURE

OF THE

PROVINCE OF ONTARIO,

FOR THE YEAR 1881.

I.—CIVIL GOVERNMENT.

To be voted per Statement (A).....$178,229.00.

No. of Vote.	A.	1880.	1881.	Compared with Estimates of 1880.	
				Increase.	Decrease.
	The Salaries and Contingencies of the following Departments and Offices.	$ cts.	$ cts.	$ cts.	$ cts.
1	Government House	5,580 00	5,580 00		
2	Lieutenant-Governor's Office	3,350 00	3,350 00		
3	Executive Council and Attorney-General's Department	14,470 00	14,790 00	320 00	
4	Department of Education	20,800 00	20,690 00		110 00
5	Do Crown Lands	44,950 00	44,750 00		200 00
6	Do Public Works	19,172 00	19,094 00		78 00
7	Treasury Department	17,450 00	18,700 00	1,250 00	
8	Department of Agriculture	1,400 00	1,400 00		
9	Public Institutions	7,450 00	7,550 00	100 00	
10	Secretary and Registrar's Department	25,625 00	26,225 00	600 00	
11	Department of Immigration	1,400 00	1,500 00	100 00	
12	Miscellaneous	13,850 00	14,600 00	750 00	
		175,497 00	178,229 00	3,120 00	388 00

I.—CIVIL GOVERNMENT—*Continued.*

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	1881.
		$ cts.	$ cts.
	DETAILS.		
1	GOVERNMENT HOUSE.		
	Expenses.		
	Water	265 00	265 00
	Gas	900 00	900 00
	Fuel	2,000 00	2,000 00
	Repairs	700 00	700 00
	Furnishings	200 00	200 00
	Plumbing and plants	100 00	100 00
	Gardener and Caretaker	500 00	500 00
	Assistant Gardeners	715 00	715 00
	Contingencies (cleaning away snow, carting ashes, sweeping flues, &c.).	200 00	200 00
		5,580 00	5,580 00
2	LIEUTENANT-GOVERNOR'S OFFICE.		
	Salaries.		
	Private Secretary	1,200 00	1,200 00
	Official Secretary	800 00	800 00
	Messenger	400 00	400 00
	Expenses.		
	Contingencies	950 00	950 00
		3,350 00	3,350 00
3	EXECUTIVE COUNCIL AND ATTORNEY-GENERAL'S DEPARTMENT.		
	Salaries.		
	Attorney-General and Premier	5,000 00	5,000 00
	Clerk of Executive Council and Deputy of Attorney-General	2,800 00	2,800 00
	Secretary	1,200 00	800 00
	Shorthand-writer	.....	520 00
	Assistant Clerk of Executive Council	1,000 00	1,100 00
	Second do do	650 00	700 00
	Third do do	500 00	550 00
	Assistant Messenger	200 00	200 00
	Expenses.		
	Towards establishing a Law Library	200 00	200 00
	Fuel, gas and water $580 00		
	Rent 1,200 00		
	Housekeeper 500 00		
	Fireman 360 00		
	½ of $2,640 00	1,320 00	1,320 00
	Contingencies, including repairs, printing, stationery, postage, telegraph, &c.	1,600 00	1,600 00
		14,470 00	14,790 00
4	EDUCATION DEPARTMENT.		
	Salaries.		
	Minister of Education	4,000 00	4,000 00
	Deputy Minister	3,000 00	3,000 00
	Secretary	2,000 00	2,000 00
	Chief Clerk and Accountant	1,200 00	1,200 00

I.—CIVIL GOVERNMENT—*Continued.*

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	1881.
4	EDUCATION DEPARTMENT—*Continued.*	$ cts.	$ cts.
	Salaries—Continued.		
	Clerk	1,000 00	1,100 00
	Do	900 00	900 00
	Do	1,100 00	1,100 00
	Do	*550 00*	
	Do	600 00	800 00
	Do	*550 00*	
	Do	700 00	800 00
	Do	550 00	750 00
	Do	575 00	575 00
	Junior Clerk	350 00	400 00
	Do	300 00	400 00
	Messenger (transferred from Depository Branch)	400 00	365 00
	Caretaker, including all allowances for cleaning, washing and scrubbing.	500 00	500 00
		18,275 00	17,890 00
	Expenses.		
	Postages	450 00	550 00
	Printing, paper for circulars and blanks	400 00	400 00
	Fuel and light	400 00	400 00
	Office stationery and account books	300 00	300 00
	Books on education, periodicals, papers, law and other reports	150 00	150 00
	Law appeal cases	200 00	200 00
	Office furniture and fixtures, petty repairs and incidentals	200 00	200 00
	Travelling and other expenses		200 00
	Unpaid accounts for 1880	425 00	409 00
		20,800 00	20,690 00
5	CROWN LANDS DEPARTMENT.		
	Salaries.		
	Commissioner	4,000 00	4,000 00
	Assistant Commissioner	2,800 00	2,800 00
	Law Clerk	1,800 00	1,800 00
	Shorthand writer and Clerk	1,000 00	1,000 00
	Land Sales and Free Grants:—		
	Chief Clerk	1,700 00	1,700 00
	Clerk	1,250 00	1,250 00
	Do	1,000 00	1,100 00
	Do	850 00	950 00
	Do	750 00	800 00
	Surveys, Patents and Roads:—		
	Chief Clerk, Surveys	1,500 00	1,700 00
	Do Draughtsman	950 00	1,000 00
	Chief Clerk, Patents	1,400 00	1,400 00
	Clerk	1,200 00	1,200 00
	Superintendent, Colonization Roads	1,800 00	1,800 00
	Clerk	1,000 00	1,000 00
	Woods and Forests:—		
	Chief Clerk	2,000 00	2,000 00
	Clerk	1,200 00	1,200 00
	Do	850 00	900 00
	Do	700 00	700 00
	Accounts:—		
	Accountant, (6 months in 1880)	1,000 00	
	Accountant and Book-keeper	1,250 00	1,500 00
	Clerk	1,250 00	1,250 00
	Do	850 00	850 00
	Do	750 00	750 00

I.—CIVIL GOVERNMENT—*Continued.*

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	1881.
		$ cts.	$ cts.
5	CROWN LANDS DEPARTMENT—*Continued.*		
	Accounts:—Continued.		
	Registrar	1,600 00	1,600 00
	Housekeeper, with house, fuel and light	500 00	500 00
	Messenger, do do	500 00	500 00
	Expenses.		
	Contingencies, including repairs, West Wing	9,500 00	9,500 00
		44,950 00	44,750 00
6	PUBLIC WORKS DEPARTMENT.		
	Salaries.		
	Commissioner	4,000 00	4,000 00
	Architect	2,200 00	2,200 00
	Engineer	1,500 00	1,500 00
	Secretary, Public Works	1,750 00	1,750 00
	Law Clerk, one-third (balance charged to Lunatics' Estates)	400 00	400 00
	Accountant and General Clerk	800 00	850 00
	Architectural Draughtsman	939 00	950 00
	Engineering do	939 00	800 00
	Assistant do	700 00	600 00
	First Clerk	850 00	850 00
	Clerk and Paymaster of outlying works	700 00	750 00
	Carpenter (engaged in Public Buildings generally)	624 00	624 00
	Messenger	450 00	500 00
	Expenses.		
	One-half of cost of office maintenance (see details under Executive Council Office)	1,320 00	1,320 00
	Contingencies	2,000 00	2,000 00
		19,172 00	19,094 00
7	TREASURY DEPARTMENT.		
	Salaries.		
	Treasurer	4,000 00	4,000 00
	Assistant Treasurer	2,000 00	2,000 00
	Chief Clerk	1,000 00	1,000 00
	Clerk of Contingencies and Shorthand Writer	1,050 00	1,100 00
	Clerk of Statistics	.....	1,200 00
	Clerk	600 00	600 00
	Audit Branch:—		
	Auditor (former Auditor, $2,000)	1,600 00	1,800 00
	Book-keeper	1,100 00	900 00
	Clerk (formerly in Treasury Office)	800 00	800 00
	Expenses.		
	Cost of maintenance of East Wing (including repairs)	2,500 00	2,500 00
	Housekeeper, with house, fuel and light	400 00	400 00
	Fireman	400 00	400 00
	Contingencies, including repairs, printing, stationery, postage, telegraph, etc.	2,000 00	2,000 00
		17,450 00	18,700 00

I. CIVIL GOVERNMENT—*Continued.*

No. of Vote.	SERVICE.			Salaries & Expenses. 1880.	Salaries & Expenses. 1881.
				$ cts.	$ cts.
8	Department of Agriculture.				
	Salaries.				
	Secretary			1,000 00	1,000 00
	Expenses.				
	Contingencies, including stationery, postage, and repairs			400 00	400 00
				1,400 00	1,400 00
9	Public Institutions.				
	Salaries.				
	Inspector			3,000 00	3,000 00
	First Clerk			1,000 00	1,000 00
	Second Clerk			700 00	700 00
	Clerk and Shorthand writer			1,000 00	1,100 00
	Messenger, youth			250 00	250 00
	Expenses.				
	Travelling			700 00	700 00
	Postage	for 1880	$250 00		
	Printing	"	350 00		
	Stationery	"	50 00		
	Contingencies	"	150 00		
				800 00	800 00
				7,450 00	7,550 00
10	Secretary and Registrar's Department.				
	Salaries.				
	Secretary and Registrar			4,000 00	4,000 00
	Assistant Secretary			1,600 00	1,600 00
	Clerk			900 00	1,000 00
	Two Clerks, $800 each			1,550 00	1,600 00
	Deputy Registrar			1,200 00	1,200 00
	Two Clerks			1,500 00	1,600 00
	Messenger			400 00	400 00
	Expenses.				
	Printing and binding		$600 00		
	Stationery		400 00		
	Postage and telegraph		600 00		
	Contingencies		300 00		
				1,900 00	1,900 00
				13,050 00	13,300 00
	Registar-General's Branch.				
	Salaries.				
	First Clerk			1,200 00	1,200 00
	Second Clerk			800 00	900 00
	Clerk and Shorthand writer			800 00	850 00
	Clerk			800 00	800 00
	Two Clerks, $700 each			1,200 00	1,400 00

I. CIVIL GOVERNMENT—*Continued.*

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	1881.
		$ cts.	$ cts.
	SECRETARY AND REGISTRAR'S DEPARTMENT—*Continued.*		
	Expenses.		
	For supply of blank forms to Postmasters	300 00	300 00
	Indices	200 00	200 00
	Schedules, slips and circulars	1,100 00	1,100 00
	Stationery and printing	300 00	300 00
	Postage	250 00	250 00
	Express charges	25 00	25 00
	Travelling expenses inspecting District Registrars	500 00	500 00
	Binding returns—2 years	100 00	100 00
	Contingencies	150 00	150 00
		7,725 00	8,075 00
	License and Administration of Justice Accounts Branch.		
	Salaries.		
	First officer	1,600 00	1,600 00
	Accountant, License Branch	1,200 00	1,200 00
	Clerk	1,000 00	1,000 00
	do	600 00	600 00
	Expenses.		
	Stationery $200 00		
	Postage and Telegraph 200 00		
	Sundries 50 00	450 00	450 00
		4,850 00	4,850 00
11	IMMIGRATION DEPARTMENT.		
	Secretary	1,200 00	1,300 00
	Contingencies	200 00	200 00
		1,400 00	1,500 00
12	MISCELLANEOUS.		
	Cost of Official Gazette	4,200 00	4,200 00
	Queen's Printer's Salary	1,200 00	1,200 00
	Clerk	500 00	500 00
	Contingencies, including stationery, postage, etc.	100 00	100 00
	Inspector of Registry Offices, including travelling expenses	1,500 00	1,500 00
	Inspector of Division Courts	1,400 00	1,400 00
	Clerk	.....	600 00
	Travelling expenses, stationery, postage and office furniture	400 00	550 00
	Inspector of Insurance } Paid by tax on Insurance	2,000 00	2,000 00
	Clerk } Companies, under Act	600 00	600 00
	Contingencies (travelling and office expenses) } of 1879.	400 00	400 00
	General Clerk of Works and repairs for Public Institutions (heretofore paid out of the various appropriations)	1,200 00	1,200 00
	Inspection of Offices of Deputy Clerks of the Crown, Deputy Master and Registrars in Chancery, and County Courts, travelling expenses.	350 00	350 00
		13,850 00	14,600 00

II.—LEGISLATION.

To be voted per Statement (A).....$108,900.00.

No. of Vote.	A.	1880.	1881.	Compared with Estimates of 1880.	
				Increase.	Decrease.
		$ cts.	$ cts.	$ cts.	$ cts.
13	Legislation	108,800 00	108,900 00	100 00	

No. of Vote.	SERVICE.	Salaries & Expenses.	
		1880.	1881.
		$ cts.	$ cts.
	Details.		
13	*Salaries.*		
	Mr. Speaker's salary	1,250 00	1,250 00
	Clerk of the House, salary	1,800 00	1,800 00
	Clerk, Assistant, and Clerk of Routine	1,000 00	1,100 00
	Law Clerk	1,000 00	1,000 00
	Clerk and Postmaster	900 00	900 00
	Librarian	1,400 00	1,400 00
	Accountant of the House and Stationery Clerk (also Queen's Printer)	400 00	400 00
	Sergeant-at-Arms	600 00	600 00
	Housekeeper and Chief Messenger, with house, fuel and light	600 00	600 00
	Three Messengers	1,350 00	1,350 00
	Fireman	400 00	400 00
	Night Watchman	450 00	450 00
	Sessional Clerks, Writers, Messengers and Pages	7,000 00	7,000 00
	Expenses.		
	Postages and cost of House Post Office	3,000 00	3,000 00
	Stationery, including Printing Paper, Printing and Binding	18,000 00	18,000 00
	Printing Bills and Distributing Statutes	3,000 00	3,000 00
	Library, for Books and Binding	3,000 00	3,000 00
	Indemnity to Members, including Mileage	55,000 00	55,000 00
	Subscriptions to Newspapers and Periodicals	1,000 00	1,000 00
	Repairs and Furniture	2,000 00	2,000 00
	Fuel	1,500 00	1,500 00
	Gas and other Lighting	1,700 00	1,700 00
	Water	450 00	450 00
	Contingencies	2,000 00	2,000 00
		108,800 00	108,900 00

III.—ADMINISTRATION OF JUSTICE.

To be voted as per Statement (A).....$280,990.00.

No. of Vote.	A.	1880.	1881.	Compared with Estimates of 1880.	
				Increase.	Decrease.
		$ cts.	$ cts.	$ cts.	$ cts.
14	Superior Judges and Court of Appeal	16,300 00	16,320 00	20 00	
15	Court of Chancery	20,595 00	20,615 00	20 00	
16	Court of Queen's Bench	9,620 00	9,620 00		
17	Court of Common Pleas	5,310 00	5,660 00	350 00	
18	Practice and other Courts	4,900 00	4,900 00		
19	Criminal Justice	164,000 00	154,000 00		10,000 00
20	Miscellaneous Justice	66,875 00	69,875 00	3,000 00	
		287,600 00	280,990 00	3,390 00	10,000 00

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	1881.
	Details.	$ cts.	$ cts.
14	Superior Judges and Court of Appeal.		
	Salaries.		
	Allowances granted to Heir and Devisee Commissioners	13,000 00	13,000 00
	Registrar of Court of Appeal	2,000 00	2,000 00
	Usher and Crier	50 00	50 00
	Messenger	450 00	450 00
	Assistance in office, engrossing and copying Orders, in lieu of clerk	400 00	400 00
	Expenses.		
	Law Library	100 00	100 00
	Contingencies	300 00	320 00
		16,300 00	16,320 00
15	Court of Chancery.		
	Salaries.		
	Master	3,000 00	3,000 00
	Taxing Officer	1,600 00	1,600 00
	Other Officers		13,150 00
	Clerk	1,000 00	
	Junior Clerk	600 00	
	Registrar	2,100 00	
	First Assistant Registrar	1,200 00	
	Second " Clerk	1,000 00	
		600 00	
	" of Records and Writs	1,200 00	
	" Records Office	650 00	
	Referee in Chambers	2,000 00	
	*Clerk to " " *	900 00	
	Clerk of Accounts	1,400 00	
	Assistant Clerk of Accounts, (residue of Salary born by Suitor's Fund)	500 00	

III.—ADMINISTRATION OF JUSTICE—*Continued.*

No. of Vote.	SERVICE.			Salaries & Expenses. 1880.	1881.
				$ cts.	$ cts.
	COURT OF CHANCERY.—*Continued.*				
	Salaries—Continued.				
	Usher of Court			600 00	600 00
	Messenger and Housekeeper, with house, fuel and light			400 00	400 00
	Expenses.				
	Contingencies:—				
	Judge's Library	for 1881	$200 00		
	Referee in Chambers	"	350 00		
	Clerk of Accounts	"	285 00		
	Master's Office	"	300 00		
	Registrar's and Records and Writs	"	730 00	1,845 00	1,865 00
				20,595 00	20,615 00
16	COURT OF QUEEN'S BENCH.				
	Salaries.				
	Salaries of Officers			.....	6,300 00
	Clerk of the Crown and Pleas			*3,000 00*	
	Senior Clerk			*1,400 00*	
	Clerk (including attendance at Court of single Judge)			*1,300 00*	
	Junior Clerk			*600 00*	
	Clerk of the Process			1,200 00	1,200 00
	Assistant to "			700 00	700 00
	Housekeeper and Messenger, with house, fuel and light			500 00	500 00
	Usher and Crier, " " "			160 00	160 00
	Assistant Messenger			160 00	160 00
	Expenses.				
	Judges' Library			100 00	100 00
	Queen's Bench and Process Office			500 00	500 00
				9,620 00	9,620 00
17	COURT OF COMMON PLEAS.				
	Salaries.				
	Clerk of Crown and Pleas			2,500 00	2,500 00
	Senior Clerk			1,400 00	1,400 00
	Junior "			1,000 00	1,000 00
	Usher and Grier			160 00	160 00
	Expenses.				
	Judges' Library			100 00	100 00
	Contingencies			150 00	150 00
	Travelling and contingent expenses, inspecting offices of Deputy Clerks, Clerks of County Court, and Registrars of Surrogate			.....	350 00
				5,310 00	5,660 00
18	PRACTICE AND OTHER COURTS.				
	Salaries.				
	Clerk in Chambers			1,800 00	1,800 00
	Clerk of Surrogate (including expense of assistance)			2,000 00	2,000 00
	Clerk of Assize			1,000 00	1,000 00

III.—ADMINISTRATION OF JUSTICE—*Continued.*

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	1881.
		$ cts.	$ cts.
	PRACTICE AND OTHER COURTS—*Continued.*		
	Expenses.		
	Contingencies of Clerk in Chambers $50 00		
	" Surrogate Court 20 00		
	" Clerk of Assize 30 00		
		100 00	100 00
		4,900 00	4,900 00
19	CRIMINAL JUSTICE.		
	Crown Counsel Prosecutions	10,000 00	10,000 00
	Administration of Criminal Justice (including payments to witnesses in Criminal cases)	150,000 00	140,000 00
	J. W. Murray, Provincial Detective	.....	1,500 00
	Special Services	4,000 00	2,500 00
		164,000 00	154,000 00
20	MISCELLANEOUS JUSTICE.		
	Deputy Clerks of the Crown and Pleas, salaries	16,000 00	16,000 00
	District of Algoma.		
	Sheriff's salary	1,400 00	1,400 00
	Registrar's salary	800 00	800 00
	Clerk of the Peace and District Attorney	800 00	800 00
	Clerk of the District Court	500 00	500 00
	Administration of Justice	4,000 00	4,000 00
	Rents	175 00	175 00
		7,675 00	7,675 00
	District of Thunder Bay.		
	Two Stipendiary Magistrates, salaries	2,400 00	2,400 00
	Sheriff's salary	800 00	800 00
	Administration of Justice	5,500 00	5,500 00
	Deputy Clerk, District Court	150 00	150 00
		8,850 00	8,850 00
	District of Nipissing.		
	Stipendiary Magistrate, salary	1,400 00	1,400 00
	" " for Northern Nipissing	1,200 00	1,200 00
	Administration of Justice in Southern portion	500 00	500 00
	" " including travelling expenses in Northern portion	1,000 00	1,000 00
		4,100 00	4,100 00
	District of Parry Sound.		
	Stipendiary Magistrate	1,800 00	1,800 00
	Administration of Justice	600 00	600 00
		2,400 00	2,400 00
	District of Muskoka.		
	Stipendiary Magistrate, salary	1,800 00	1,800 00
	Administration of Justice	500 00	500 00
		2,300 00	2,300 00

III.—ADMINISTRATION OF JUSTICE—*Continued.*

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	**1881.**
		$ cts.	$ cts.
20	Miscellaneous Justice—*Continued.*		
	Provisional County of Haliburton.		
	Stipendiary Magistrate, salary	1,200 00	1,200 00
	Administration of Justice	500 00	500 00
		1,700 00	1,700 00
	Provincial Police, at Clifton and Fort Erie.		
	Salary of Police Magistrate	1,000 00	1,000 00
	Administration of Justice	4,000 00	4,000 00
		5,000 00	5,000 00
	Other Services.		
	To pay Sheriffs, Criers and Constables in attending Courts of Chancery and County Courts, Deputy Clerks of the Crown and Pleas attending Assizes, and their postages, &c.	6,000 00	6,000 00
	Seals and other contingencies	300 00	300 00
	Registration Books for Muskoka, Parry Sound and Thunder Bay	200 00	200 00
	Lighting and heating Osgoode Hall	4,000 00	4,000 00
	Water supply	250 00	250 00
	Furniture, matting, repairs, &c.		500 00
	For employment of Shorthand Reporters of evidence on trials at the Assizes and Election Courts (three additional Reporters)	7,000 00	9,500 00
	Expenses of County Judges in grouped Counties	1,100 00	1,100 00
		18,850 00	21,850 00

IV.—EDUCATION.

To be voted per Statement (A).....$505,025.73.

No. of Vote.	A	1880.	1881.	Compared with Estimates of 1880.	
				Increase.	Decrease.
		$ cts.	$ cts.	$ cts.	$ cts.
21	Public and Separate Schools	240,000 00	240,000 00		
22	Schools in new and poor Townships	13,500 00	13,500 00		
23	Inspection of Public and Separate Schools	29,630 00	31,045 00	1,415 00	
24	High Schools and Collegiate Institutes	83,000 00	84,500 00	1,500 00	
25	Inspection of " "	7,400 00	7,600 00	200 00	
26	Training of Teachers	19,539 10	10,350 00		9,189 10
27	Departmental Examinations	7,600 00	9,300 00	1,700 00	
28	Normal and Model Schools, Toronto	21,975 00	22,650 00	675 00	
29	Normal and Model School, Ottawa	12,173 33	18,942 60	6,769 27	
30	Educational Depository, Museum and Library	22,051 83	8,855 00		13,196 83
31	Miscellaneous	1,700 00	450 00		1,250 00
32	Superannuated Teachers	42,400 00	57,833 13	15,433 13	
		500,969 26	505,025 73	27,692 40	23,635 93

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	1881.
	Details.	$ cts.	$ cts.
21	Public and Separate Schools	240,000 00	240,000 00
22	Schools in new and poor Townships	13,500 00	13,500 00
23	Inspection of Public and Separate Schools.		
	5,400 Public and Separate Schools at $5 (5,370 in 1880)	26,850 00	27,000 00
	52 County Model Schools at $10 (51 in 1880)	510 00	520 00
	Proportion of payments to Inspectors in the Territorial and remote Districts, viz.: (1) Algoma, (2) Parry Sound, (3) Nipissing, (4) Haliburton, and (5) the Northern parts of the Counties of Victoria, Peterborough, Hastings, Addington, and Renfrew	1,500 00	1,850 00
	Stationery, postages, printing paper, and incidentals	600 00	700 00
	Unpaid for inspection in 1879	*170 00*	
	Unpaid for inspection in 1880		975 00
		29,630 00	31,045 00
24	High Schools and Collegiate Institutes.		
	105 existing High Schools, 16 being Collegiate Institutes (104 last year)	72,500 00	72,500 00
	16 Collegiate Institutes, at $750 additional each (14 last year)	10,500 00	12,000 00
		83,000 00	84,500 00

IV.—EDUCATION—*Continued.*

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	1881.
		$ cts.	$ cts.
	Details—Continued.		
25	Inspection of High Schools and Normal Schools.		
	Three Inspectors' salaries at $2,000	6,000 00	6,000 00
	Payment of actual expenses incurred in travelling	1,100 00	1,200 00
	Printing forms of Reports, and paper, postages and incidentals	300 00	400 00
		7,400 00	7,600 00
26	Training of Public School Teachers.		
	Towards travelling expenses of (say 100) students for the last Session of 1880 and first of 1881 at Toronto and Ottawa Normal Schools, only half expenses to be paid for first Session of 1881, and then allowance to cease	5,400 00	1,650 00
	Towards 52 Public Schools selected as County Model Schools, $100 each (51 in 1880)	5,100 00	5,200 00
	Inspection of County Model Schools (supplementary estimates) $4,900 00		
	Unpaid for " " in 1879 do 639 10		
		5,539 10	
	Towards 60 Teachers' Institutes and Associations (58 in 1880)	2,900 00	3,000 00
	Unpaid in 1879 for " " " "	*300 00*	
	Printing paper, stationery, travelling expenses and incidentals	300 00	500 00
		19,539 10	10,350 00
27	Departmental Examinations.		
	Central Committee of Examiners, 7 in number, for preparing Examination Papers for (1) 1st, 2nd and 3rd Class Public School Teachers certificate; and (2) High School Intermediate; and reading and valuing answers, in cases of appeal	2,750 00	1,800 00
	40 Sub-Examiners for reading and valuing the answers of all Candidates for 2nd and 3rd class certificates, and at the Intermediate, the estimated number being 5,000	2,600 00	4,600 00
	Actual travelling expenses of non-resident Members and Sub-Examiners	350 00	500 00
	Examinations of Normal School students at end of each of the three sessions		300 00
	Postages, stationery and incidentals	400 00	400 00
	Confidential printing of all examination papers—		
	(1) Ink, fire, light, water, and incidentals	250 00	300 00
	(2) Paper for printing; also for certificates, forms and circulars	650 00	650 00
	(3) Salary of Printer and Assistant	600 00	750 00
		7,600 00	9,300 00
28	Normal and Model Schools, Toronto.		
	Salaries.		
	The Principal	2,000 00	2,000 00
	Science Master	1,800 00	1,800 00
	Mathematical Master	1,500 00	1,500 00
	Writing and Book-keeping Master	1,000 00	1,000 00
	Drawing Master	600 00	700 00
	Music Master	500 00	600 00
	Teacher of Reading and Elocution, according to time employed	450 00	500 00
	Gymnastic Master	300 00	300 00
	Head Master of Boys' Model School	1,200 00	1,200 00
	First Assistant "	1,000 00	1,000 00
	Second " "	900 00	900 00
	Third " "	800 00	800 00
	Head Mistress of Girls' Model School	1,000 00	1,000 00
	First Assistant "	800 00	800 00
	Second " "	700 00	700 00
	Third " "	650 00	650 00

IV.—EDUCATION—*Continued.*

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	1881.
		$ cts.	$ cts.
28	Normal and Model Schools, Toronto—*Continued.*		
	Salaries.		
	Clerk of the Normal and Model School	600 00	600 00
	Head Gardener, with house and fuel	410 00	410 00
	First Engineer, with house and fuel	410 00	410 00
	Second "	400 00	400 00
	Third "	360 00	380 00
	Janitor of Normal School, including scrubbing and cleaning	450 00	450 00
	" Boys' Model School " " "	420 00	400 00
	" Girls' " " " "	400 00	400 00
	Assistant Gardener	400 00	400 00
		19,050 00	19,300 00
	Expenses.		
	Text and reference books for masters, and reading-room for students	200 00	200 00
	Stationery, printing paper, chemicals and supplies	400 00	400 00
	Expenses of grounds	300 00	300 00
	Fuel and light, proportion of	1,000 00	1,200 00
	Water service	450 00	450 00
	Petty repairs, furniture and incidentals	400 00	400 00
	Text Books for Model School pupils (formerly in Depository Branch), to be dispensed with after July next		200 00
	Prize Books for Model School pupils (formerly in Depository Branch),		200 00
	Unpaid accounts of 1879	*175 00*	
	(Fees from Model School pupils for 1880, $8,000).		
		21,975 00	22,650 00
29	Normal School, Ottawa.		
	Salaries.		
	The Principal	2,000 00	2,000 00
	Science Master	1,500 00	1,500 00
	Teacher of Reading and Elocution, according to time employed	450 00	500 00
	Writing and Book-keeping Master (3 months in 1880)		500 00
	Drawing Master	400 00	700 00
	Music Master	200 00	600 00
	Head Master of Boys' Model Scoool (4 months in 1880)	333 34	1,100 00
	First Assistant " "	266 66	850 00
	Second " " "		750 00
	Third " " "		650 00
	Head Mistress of Girls' Model School (4 months in 1880)	233 33	900 00
	First Assistant " "	200 00	700 00
	Second " " "		600 00
	Third " " "		550 00
	Clerk and Accountant	600 00	600 00
	Drill and Gymnastic Instructor	250 00	250 00
	First Engineer and Gardener	600 00	600 00
	Second " Assistant Gardener	400 00	400 00
	Two Labourers on grounds in summer, at $240	480 00	480 00
	Janitor, Normal School	360 00	360 00
	" " to pay for scrubbing and cleaning	150 00	150 00
	" Model School (4 months in 1880)	150 00	360 00
	" " to pay for scrubbing and cleaning		150 00
		8,573 33	15,250 00
	Expenses.		
	Text and reference books for masters, and reading-room for students	200 00	200 00
	Stationery, printing paper, chemicals and supplies	300 00	400 00

IV.—EDUCATION—*Continued.*

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	1881.
		$ cts.	$ cts.
29	NORMAL SCHOOL, OTTAWA—*Continued.*		
	Expenses.		
	Expenses of grounds (including plants, shrubs, trees, &c.)	400 00	400 00
	Fuel and light	1,000 00	1,200 00
	Water	300 00	400 00
	Petty repairs, furniture and incidentals	400 00	400 00
	Unpaid accounts for 1880	.....	242 60
	Public School Board, Ottawa, for use of City Schools.....(Supplementary Estimates)	*1,000 00*	.....
	Text Books for Model School pupils (to be dispensed with after 1st July next)	.....	250 00
	Prize Books for Model School pupils	.....	200 00
	(Fees from Model School pupils since Sept., 1880, 3 months, $1,183).		
		12,173 33	18,942 60
30	EDUCATIONAL DEPOSITORY, MUSEUM AND LIBRARY.		
	Salaries.		
	Superintendent	1,400 00	1,400 00
	Clerk	1,000 00	1,100 00
	"	520 00	520 00
	Senior Clerks, now dispensed with, except one clerk for three months	*1,750 00*	150 00
	Junior Clerks, " " six "	*900 00*	250 00
	Messenger and Packer, transferred to Civil Government	*365 00*	.....
	Caretaker	100 00	100 00
		6,035 00	3,520 00
	Expenses (Depository).		
	Amount paid for purchases from Booksellers in 1880	3,000 00	1,000 00
	For purchases of additional stock in 1880	*9,000 00*	.....
	Supply of text books for sale to Normal School students	.....	1,350 00
	Supply of chemical laboratories for rental to Normal School students	.....	310 00
		18,035 00	6,180 00
	Expenses (Museum and Library).		
	Postages	300 00	150 00
	Stationery	100 00	50 00
	Fuel, water and light	400 00	200 00
	Printing paper for forms and circulars	250 00	250 00
	Printing catalogues	*400 00*	.....
	Packing paper, twine, nails, &c.	150 00	75 00
	Furnishings, incidentals and repairs	200 00	100 00
	Catalogue of educational works for general reference....(Supplementary Estimates)	*666 83*	.....
		2,466 83	825 00
	Frames and stands for photographs and engravings	150 00	150 00
	Binding educational and Canadian books and pamphlets	600 00	300 00
	Printing catalogue Educational Library and Museum	200 00	200 00
	Incidentals	200 00	200 00
	Fitting up new rooms, and also for Patent Office Reports	.....	500 00
	Fire, water and light (proportion)	400 00	500 00
		4,016 83	2,675 00

IV.—EDUCATION—*Concluded.*

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	**1881.**
		$ cts.	$ cts.
31	MISCELLANEOUS.		
	Queen's Printer, proportion of cost of Minister's Annual Report for 1880	300 00	450 00
	" *Public and High School Registers*	*1,000 00*	....
	Revision of text books	*400 00*	....
		1,700 00	450 00
32	SUPERANNUATED PUBLIC AND HIGH SCHOOL TEACHERS.		
	Annual retiring allowance to 420 (391 in 1880) Teachers, (amount received for this Fund from Teachers, $15,816)	40,000 00	50,500 00
	Additional for 1st and 2nd Class Teachers, High School Masters and Inspectors	2,000 00	1,000 00
	Allowance to worn-out Teachers, non-contributors, over 60 years of age	200 00	200 00
	Medical examination fees, printing paper and incidentals	200 00	300 00
	Unpaid amounts in 1880	.....	5,833 13
		42,400 00	57,833 13

V.—PUBLIC INSTITUTIONS MAINTENANCE.

To be voted per Statement (A)..... $534,412.80.

No. of Vote.	A.	Voted for 1880.	To be voted for 1881.	Compared with Estimates of 1880. Increase.	Decrease.
		$ cts.	$ cts.	$ cts.	$ cts.
33	Asylum for the Insane, Toronto	83,238 00	83,176 00		62 00
34	" " London	103,962 00	103,548 00		414 00
35	" " Kingston	55,214 00	54,834 00		380 00
36	" " Hamilton	45,983 00	58,004 99	12,021 99	
37	Asylum for Idiots, Orillia	20,574 00	19,674 00		900 00
38	Central Prison, Toronto	62,070 00	68,470 00	6,400 00	
39	Ontario Reformatory for Boys, Penetanguishene	29,664 00	29,435 54		228 46
40	Institution for the Deaf and Dumb, Belleville	38,033 00	36,623 00		1,410 00
41	" " Blind, Brantford	30,139 00	30,797 00	658 00	
42	Andrew Mercer Reformatory for Women and Refuge for Girls, Toronto	11,582 00	23,520 27	11,938 27	
43	School of Agriculture, Guelph	23,750 00	20,930 00		2,820 00
44	School of Practical Science	5,400 00	5,400 00		
		509,609 00	534,412 80	31,018 26	6,214 46

No. of Vote.	SERVICE.	No. of Officers and Employees.	Salaries & Expenses. 1880.	1881.
	Details.		$ cts.	$ cts.
33	Asylum for the Insane, Toronto.			
	(For 670 Patients; 670 for 1880.)			
	Salaries.			
	Medical Superintendent	1	2,000 00	2,000 00
	Assistant "	1	1,000 00	1,000 00
	Second Assistant Physician	1	800 00	800 00
	Bursar	1	1,400 00	1,400 00
	Bursar's Clerk	1	500 00	500 00
	Steward	1	700 00	700 00
	Storekeeper	1	600 00	600 00
	Engineer	1	740 00	740 00
	Stokers	2	504 00	504 00
	Engine-driver for new laundry	1	240 00	240 00
	Bricklayer and Mason	1	550 00	550 00
	Carpenters	2	1,050 00	1,050 00
	Gardener	1	400 00	400 00
	Assistant Gardener	1	216 00	216 00
	Porter or Messenger	1	240 00	240 00
	Baker	1	400 00	400 00
	Assistant Baker	1	216 00	216 00
	Tailor	1	500 00	500 00
	Farmer and Assistant	2	480 00	480 00
	Teamster	1	216 00	216 00
	Night Watchers	3	720 00	720 00
	Chief Attendants	7	1,848 00	1,980 00
	Ordinary Male Attendants	17	3,624 00	3,672 00

V.—PUBLIC INSTITUTIONS MAINTENANCE—*Continued.*

No. of Vote.	SERVICE.	No. of Officers and Employees.	Salaries & Expenses. 1880.	Salaries & Expenses. 1881.
			$ cts.	$ cts.
33	ASYLUM FOR THE INSANE, TORONTO—*Continued.*			
	FEMALES.			
	Salaries.			
	Matron	1	400 00	400 00
	Assistant Matron	1	192 00	192 00
	Chief Attendants	6	672 00	720 00
	Ordinary "	17	1,656 00	1,704 00
	Night "	3	360 00	360 00
	Cooks	5	564 00	564 00
	Laundresses	5	504 00	504 00
	Housemaids	5	468 00	468 00
	Seamstress	1	108 00	120 00
	Dairymaid	1	120 00	120 00
		95	23,988 00	24,276 00
	Expenses.			
	Medicine and medical comforts		450 00	450 00
	Fuel		7,500 00	9,000 00
	Butcher's meat, fish and fowl		11,500 00	11,500 00
	Flour		8,000 00	8,000 00
	Butter		4,000 00	4,000 00
	Gas and oil		2,250 00	2,250 00
	Water supply		2,000 00	2,000 00
	Groceries		9,500 00	9,000 00
	Fruit and vegetables		1,000 00	750 00
	Bedding, clothing and shoes		5,500 00	4,500 00
	Furniture and furnishings		1,500 00	1,500 00
	Laundry, soap and cleaning		1,200 00	1,100 00
	Farm, feed and fodder		1,000 00	1,000 00
	Miscellaneous		1,500 00	1,000 00
	Repairs and alterations		1,500 00	2,000 00
	Printing, postage and stationery		850 00	850 00
			83,238 00	83,176 00
34	ASYLUM FOR THE INSANE, LONDON.			
	(For 900 Patients; 850 in 1880.)			
	Salaries.	No. of Officers and Employees.		
	Medical Superintendent	1	2,000 00	2,000 00
	First Assistant Physician	1	1,000 00	1,000 00
	Second " (Refractory Ward)	1	800 00	800 00
	Third "	1	600 00	600 00
	Bursar	1	1,400 00	1,400 00
	Steward and Storekeeper	1	800 00	800 00
	Engineer	1	740 00	740 00
	Assistant Engineer	1	400 00	400 00
	Stokers	5	1,332 00	1,296 00
	Bricklayer and Plasterer	1	550 00	550 00
	Carpenters	2	1,050 00	1,050 00
	Painter	1	300 00	300 00
	Tailor	1	.....	460 00
	Gardener	1	400 00	400 00
	Assistant Gardener	1	240 00	240 00
	Butcher and Jobber	1	216 00	168 00
	Yardman	1	.....	240 00
	Porter and Messenger	1	192 00	240 00
	Baker	1	400 00	400 00
	Assistant Baker	1	216 00	216 00

V.—PUBLIC INSTITUTIONS MAINTENANCE—*Continued.*

No. of Vote.	SERVICE.		Salaries & Expenses. 1880.	**1881.**
			$ cts.	$ cts.
34	Asylum for the Insane, London—*Continued.*			
	Salaries.	No. of Officers and Employees.		
	Farmer	1	400 00	400 00
	Ploughmen	2	672 00	552 00
	Night Watchmen	3	744 00	744 00
	Chief Attendants	3	936 00	936 00
	Ordinary Male Attendants	27	5,688 00	5,856 00
	Cowman	1	216 00	216 00
	Females.			
	Matron	1	500 00	500 00
	Assistant Matron (refractory ward)	1	250 00	250 00
	Chief Attendant	1	250 00	250 00
	Ordinary Female Attendants	28	3,276 00	3,420 00
	Night Attendants	3	396 00	396 00
	Cooks and Assistant Cooks	5	660 00	660 00
	Laundresses	5	552 00	552 00
	Housemaids	9	936 00	936 00
	Dairymaid	1	120 00	120 00
	Tailoress	1	120 00	....
	Seamstresses	2	240 00	240 00
	Porteress	1	120 00	120 00
		120	28,712 00	29,448 00
	Expenses.			
	Medicine and medical comforts		500 00	600 00
	Fuel		11,500 00	10,500 00
	Butchers' meat, fish and fowl		13,500 00	13,500 00
	Flour		10,000 00	10,000 00
	Butter		4,000 00	4,000 00
	Gas and oil		3,000 00	2,500 00
	Groceries		11,000 00	11,000 00
	Fruit and vegetables		1,250 00	750 00
	Bedding, clothing and shoes		10,000 00	10,500 00
	Furniture and furnishings		1,500 00	2,000 00
	Laundry, soap and cleaning		2,000 00	1,750 00
	Farm, feed and fodder		2,000 00	2,000 00
	Miscellaneous		1,500 00	1,500 00
	Repairs and alterations		2,500 00	2,500 00
	Printing, postage and stationery		1,000 00	1,000 00
			103,962 00	103,548 00
35	Asylum for the Insane, Kingston.			
	(For 430 Patients, 430 in 1880.)			
	Salaries.	No. of Officers and Employees.		
	Medical Superintendent	1	1,600 00	1,600 00
	Assistant Physician	1	1,000 00	1,000 00
	Bursar	1	1,200 00	1,200 00
	Steward	1	500 00	500 00
	Storekeeper	1	500 00	500 00
	Engineer	1	700 00	700 00
	Assistant Engineer	1	400 00	400 00
	Stoker	1	300 00	300 00
	Carpenter	1	450 00	450 00
	Baker	1	400 00	400 00
	Cook	1	360 00	360 00
	Farmer	1	400 00	400 00

V.—PUBLIC INSTITUTIONS MAINTENANCE.—*Continued.*

No. of Vote.	SERVICE.		Salaries & Expenses. 1880.	**1881.**
			$ cts.	$ cts.
35	ASYLUM FOR THE INSANE, KINGSTON.—*Continued.*			
	Salaries.	No. of Officers and Employees.		
	Gardener	1	400 00	400 00
	Ploughman	1	360 00	360 00
	Messenger, Porter and Telegraph Operator	1	180 00	200 00
	Night Watchers	2	600 00	600 00
	Attendants	5	1,800 00	1,800 00
	Ordinary Attendants	12	3,640 00	3,640 00
	FEMALES.			
	Matron	1	400 00	400 00
	Assistant Matron	1	.....	200 00
	Attendants	12	1,440 00	1,440 00
	Night Watchers	2	240 00	240 00
	Laundresses	2	264 00	264 00
	Domestics	2	180 00	180 00
		54	17,314 00	17,534 00
	Expenses.			
	Medicines		300 00	350 00
	Butcher's Meat, Fish, and Fowl		7,000 00	7,250 00
	Butter		2,250 00	2,350 00
	Flour		5,000 00	5,000 00
	Fuel		7,000 00	7,500 00
	Gas and Oil		500 00	500 00
	Groceries		5,000 00	4,000 00
	Fruit and Vegetables		750 00	500 00
	Milk		500 00	.....
	Bedding, Clothing, and Shoes		4,000 00	4,000 00
	Furniture and Furnishings		1,000 00	1,000 00
	Laundry, Soap, and Cleaning		750 00	750 00
	Printing, Postage, and Stationery		600 00	600 00
	Farm, Feed, and Fodder		1,250 00	1,250 00
	Repairs		1,000 00	1,250 00
	Miscellaneous		1,000 00	1,000 00
			55,214 00	54,834 00
36	ASYLUM FOR THE INSANE, HAMILTON. (For 530 Patients, 400 in 1880.)			
	Salaries	No. of Officers and Employees.		
	Medical Superintendent	1	1,600 00	1,600 00
	Assistant Physician	1	800 00	1,000 00
	Bursar	1	800 00	1,000 00
	Storekeeper	1	600 00	600 00
	Engineer	1	600 00	600 00
	Assistant Engineer	1	240 00	240 00
	Stoker, in winter, Farm hand in summer	1	240 00	360 00
	Carpenter	1	500 00	500 00
	Baker	1	400 00	400 00
	Gardener and Farmer	1	400 00	400 00
	Messenger and Porter	1	200 00	200 00
	Chief Attendant	1	300 00	300 00
	Night Watch, Chief	1	365 00	365 00
	" Second	1	.....	240 00
	Ordinary Male Attendants (13 in 1880)	15	3,120 00	3,600 00
	Gate Keeper	1	.....	50 00
	Tailor	1	.....	400 00

V.—PUBLIC INSTITUTIONS MAINTENANCE.—*Continued.*

No. of Vote.	SERVICE.	No. of Officers and Employees.	Salaries & Expenses. 1880.	Salaries & Expenses. 1881.
36	Asylum for the Insane, Hamilton.—*Continued.*		$ cts.	$ cts.
	Females.			
	Matron	1	400 00	400 00
	Chief Attendant	1	200 00	200 00
	Ordinary Female Attendants	15	1,800 00	1,800 00
	Night Watch	1	144 00	264 00
	Cooks	2	264 00	264 00
	Laundresses	3	384 00	384 00
	Housemaids	4	432 00	432 00
	Seamstress and Tailoress	1	144 00	144 00
	Expenses.	59	13,933 00	15,743 00
	Medicines and Medical Comforts		300 00	300 00
	Fuel		5,000 00	6,500 00
	Butchers' Meat, Fish, and Fowl		6,000 00	7,500 00
	Flour, Bread, &c.		4,000 00	5,000 00
	Butter		1,750 00	2,500 00
	Gas and Oil		1,250 00	1,650 00
	Groceries		4,750 00	5,750 00
	Fruit and Vegetables		750 00	750 00
	Bedding, Clothing, and Shoes		3,000 00	4,000 00
	Laundry, Soap, and Cleaning		850 00	750 00
	Furniture and Furnishings		750 00	750 00
	Farm, Feed, and Fodder		1,000 00	1,200 00
	Repairs and Alterations		1,000 00	1,200 00
	Miscellaneous		750 00	750 00
	Water Supply		500 00	1,000 00
	Printing, Postage, and Stationery		400 00	500 00
	To meet unpaid accounts of previous year		....	2,161 99
			45,983 00	58,004 99
37	Asylum for Idiots, Orillia.			
	(For 150 patients, 150 in 1880.)			
	Salaries.	No. of Officers and Employees.		
	Medical Superintendent	1	1,600 00	1,600 00
	Bursar	1	1,100 00	1,100 00
	Engineer	1	600 00	600 00
	Assistant Engineer	1	340 00	340 00
	Gardener	1	375 00	375 00
	Chief Attendant	1	300 00	300 00
	Night Watch	1	340 00	340 00
	Ordinary Male Attendants	4	960 00	960 00
	Messenger, Porter, and Stable Keeper	1	240 00	240 00
	Females.			
	Matron	1	300 00	300 00
	Chief Attendant	1	225 00	225 00
	Ordinary Female Attendants	4	480 00	480 00
	Night Attendant	1	120 00	120 00
	Cooks	2	264 00	264 00
	Laundresses	2	252 00	252 00
	Housemaids	4	384 00	384 00
	Seamstress	1	144 00	144 00
		28	8,024 00	8,024 00
	Expenses.			
	Medicines and Medical Comforts		100 00	100 00
	Fuel		1,100 00	1,100 00
	Butchers' meat, fish, and fowl		2,000 00	2,000 00

V.—PUBLIC INSTITUTIONS MAINTENANCE—*Continued.*

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	**1881.**
		$ cts.	$ cts.
37	Asylum for Idiots, Orillia—*Continued.*		
	Females.		
	Expenses.		
	Flour, bread, etc.	1,750 00	1,750 00
	Butter	800 00	800 00
	Gas and oil	300 00	300 00
	Groceries	1,750 00	1,600 00
	Fruit and vegetables	700 00	500 00
	Bedding, clothing and shoes	1,500 00	1,400 00
	Laundry, soap and cleaning	450 00	400 00
	Furniture and furnishings	300 00	250 00
	Farm, feed and fodder	400 00	300 00
	Repairs	400 00	350 00
	Miscellaneous	600 00	600 00
	Milk	200 00	.....
	Printing, postage and stationery	200 00	200 00
		20,574 00	19,674 00
38	Central Prison, Toronto.		
	(For 350 Prisoners, 350 in 1880).		
	Salaries. — No. of Officers and Employees.		
	Warden — 1	2,000 00	2,000 00
	Deputy-Warden — 1	1,300 00	1,300 00
	Bursar — 1	1,200 00	1,200 00
	Physician — 1	1,000 00	1,000 00
	Steward and Storekeeper — 1	750 00	750 00
	Guards — 20	8,000 00	8,250 00
	Hospital Guard — 1	400 00	400 00
	Engineer and Assistant — 2	1,140 00	1,140 00
	Baker and Cook — 1	400 00	400 00
	— 29	16,190 00	16,440 00
	Expenses.		
	Hospital expenses and medicines	300 00	300 00
	Butchers' meat and fish	6,500 00	6,000 00
	Flour, bread and meal	5,500 00	5,000 00
	Groceries	5,500 00	5,000 00
	Bedding, clothing and shoes	5,000 00	5,000 00
	Fuel	4,000 00	4,000 00
	Gas and oil	1,000 00	900 00
	Water supply	1,000 00	1,000 00
	Laundry, soap and cleaning	700 00	700 00
	Stationery, advertising, printing, postage	500 00	500 00
	Library, schools and lectures	500 00	700 00
	Furniture and furnishings	500 00	500 00
	Stable, forage, etc.	300 00	200 00
	Grounds, etc.	300 00	300 00
	Repairs, etc.	250 00	250 00
	Unenumerated	500 00	500 00
		48,540 00	47,290 00
	Industrial Department.		
	Salaries. — No. of Officers and Employees.		
	Accountant — 1	1,000 00	1,000 00
	Shoemaker — 1	550 00	550 00
	Tailor — 1	600 00	600 00

V.—PUBLIC INSTITUTIONS MAINTENANCE—*Continued.*

No. of Vote.	SERVICE.	No. of Officers and Employees.	Salaries & Expenses. 1880.	1881.
			$ cts.	$ cts.
38	CENTRAL PRISON, TORONTO—*Continued.*			
	INDUSTRIAL DEPARTMENT.			
	Salaries.			
	Foreman and Instructors	6	2,480 00	2,480 00
	Night Watch	1	400 00	400 00
	Material	..	8,500 00	16,150 00
		10	13,530 00	21,180 00
39	ONTARIO REFORMATORY FOR BOYS, PENETANGUISHENE.			
	(For 240 Inmates; 230 in 1880.)			
	Salaries.			
	Superintendent	1	1,600 00	1,600 00
	Assistant Superintendent	1	600 00	750 00
	Bursar	1	850 00	850 00
	Surgeon	1	500 00	700 00
	Chaplains	2	800 00	800 00
	School Teachers	3	1,000 00	1,300 00
	Chief Guard and Steward	..	600 00	.....
	Superintendent of New Industries	..	550 00	.....
	Carpenter Instructor	1	500 00	500 00
	Cabinetmaker "	..	500 00	.....
	Engineer	1	500 00	600 00
	Baker and Cook	1	300 00	400 00
	Instructors in Shoe and Tailor Shops	3	1,200 00	900 00
	Farmer	1	400 00	400 00
	Gardener	1	.....	400 00
	Ordinary Guards	6	2,200 00	1,200 00
	Night Guards	2	1,160 00	800 00
	Stable and Gatekeepers	..	560 00	.....
	Gatekeeper	1	.....	350 00
	Organist	1	160 00	160 00
		27	13,980 00	11,710 00
	Expenses.			
	Rations		6,000 00	7,000 00
	Clothing		3,000 00	3,500 00
	Bedding		850 00	1,000 00
	Farm, Farm Stock, and Stables		900 00	900 00
	Hospital		150 00	150 00
	Library and Schools		500 00	500 00
	Fuel		500 00	1,000 00
	Cleaning, Light, and Laundry		450 00	500 00
	Furniture, Tools, and Shop Fixtures		600 00	400 00
	Repairs, ordinary		500 00	300 00
	Incidentals		750 00	400 00
	Postage and Stationery		350 00	400 00
	To meet Unpaid Accounts from previous year		1,134 00	2,675 54
			29,664 00	29,435 54

V.—PUBLIC INSTITUTIONS MAINTENANCE.—*Continued.*

No. of Vote.	SERVICE.	No. of Officers and Employees.	Salaries & Expenses. 1880.	1881.
			$ cts.	$ cts.
40	INSTITUTION FOR THE DEAF AND DUMB, BELLEVILLE.			
	(For 250 Pupils; 250 in 1880.)			
	Salaries.			
	Superintendent	1	1,600 00	1,600 00
	Physician	1	500 00	500 00
	Bursar	1	800 00	800 00
	Matron	1	300 00	300 00
	Teachers	14	7,500 00	7,900 00
	Visitors' Attendant and Dormitory Supervisor, now Storekeeper as well	1	100 00	.....
	Storekeeper and Clerk	1	.....	240 00
	Housekeeper	1	200 00	200 00
	Engineer	1	600 00	600 00
	Stoker	1	240 00	240 00
	Farmer	1	400 00	400 00
	Teamster	1	228 00	228 00
	Gardener	1	300 00	300 00
	Baker	1	400 00	400 00
	Night Watchman	1	240 00	240 00
	Carpenter and Assistant	2	650 00	650 00
	Shoemaker	1	500 00	500 00
	Messenger	1	120 00	120 00
	Cook	1	156 00	156 00
	Small Boys' Nurse	1	120 00	120 00
	Maid, Laundresses, and Cook's Assistant	9	864 00	864 00
	Supervisor of Boys	1	240 00	240 00
	Cutter and Seamstress	1	.....	200 00
		43	16,058 00	16,798 00
	Expenses.			
	Medicine and medical comforts		125 00	125 00
	Butchers' meat, fish, and fowl		5,000 00	3,500 00
	Flour		2,500 00	2,000 00
	Butter		1,600 00	1,800 00
	Groceries		2,750 00	2,500 00
	Fruit and vegetables		500 00	500 00
	Bedding, clothing, and shoes		600 00	600 00
	Fuel		3,500 00	3,500 00
	Gas and oil		1,300 00	1,200 00
	Laundry, soap, and cleaning		500 00	400 00
	Furniture and furnishings		500 00	500 00
	Farm, feed, and fodder		600 00	600 00
	Repairs and alterations		500 00	500 00
	Advertising, printing, stationery, and postage		400 00	500 00
	Books, apparatus and appliances		600 00	600 00
	Unenumerated		1,000 00	1,000 00
			38,033 00	36,623 00
41	INSTITUTION FOR THE BLIND, BRANTFORD.			
	(For 190 Pupils; 190 in 1880.)			
	Salaries.			
	Principal	1	1,600 00	1,600 00
	Physician	1	500 00	500 00
	Bursar	1	800 00	800 00
	Matron	1	300 00	300 00
	Teachers (14 in 1880)	15	4,600 00	5,000 00

V.—PUBLIC INSTITUTIONS MAINTENANCE—*Continued.*

No. of Vote.	SERVICE.		Salaries & Expenses. 1880.	Salaries & Expenses. 1881.
			$ cts.	$ cts.
41	INSTITUTION FOR THE BLIND, BRANTFORD.			
	Salaries.	No. of Officers and Employees.		
	Trade Instructor	1	1,000 00	1,000 00
	Visitors' Attendant and Industrial Instructor	1	156 00	156 00
	Carpenter	1	400 00	400 00
	Engineer	1	600 00	600 00
	Stoker	1	288 00	312 00
	Fireman in winter, and farm hand in summer	1	240 00	240 00
	Gardener	1	360 00	360 00
	Teamster	1	240 00	264 00
	Porter	1	240 00	264 00
	Cook and Baker	2	504 00	504 00
	Cook's Assistant	1	120 90	120 00
	Maids	9	876 00	888 00
	Laundress	1	144 00	144 00
	" Assistants	2	216 00	216 00
	Nurses	2	240 00	240 00
	Night Watchman	1	240 00	264 00
	Temporary assistance	..	100 00	100 00
		46	13,764 00	14,272 00
	Expenses.			
	Medicine and medical comforts		75 00	75 00
	Butchers' meat, fish, and fowl		3,250 00	3,000 00
	Flour, bread, &c		1,500 00	1,500 00
	Butter		1,000 00	1,200 00
	General groceries		2,250 00	2,250 00
	Fruit and vegetables		300 00	300 00
	Bedding, clothing, and shoes		400 00	400 00
	Fuel		3,000 00	3,000 00
	Gas, oil, and candles		1,000 00	1,000 00
	Laundry, soap, and cleaning		300 00	300 00
	Furniture and furnishings		500 00	500 00
	Farm, feed, and fodder		600 00	600 00
	Repairs and alterations		500 00	500 00
	Advertising, printing, stationery, and postage		500 00	600 00
	Books, apparatus, and appliances		600 00	700 00
	Unenumerated		600 00	600 00
			30,139 00	30,797 00
42	ANDREW MERCER REFORMATORY FOR FEMALES AND REFUGE FOR GIRLS, TORONTO.			
	(For 175 inmates, 150 in 1880.)			
	Salaries.	No. of Officers and Employees.		
	Superintendent	1	800 00	800 00
	Deputy do	1	600 00	600 00
	Physician	1	800 00	800 00
	Bursar and Storekeeper	1	600 00	600 00
	Housekeeper	1	.....	300 00
	Teachers (1 dispensed with)	1	600 00	300 00
	Instructor	1	900 00	400 00
	Attendants (5 in 1880)	6	900 00	1,032 00
	Gatekeeper and Visitors' Attendant	1	400 00	200 00
	Cook and Baker	1	200 00	168 00
	Cook	..	144 00	.....
	Maids	2	240 00	192 00

V.—PUBLIC INSTITUTIONS MAINTENANCE—*Continued.*

No. of Vote.	SERVICE.		Salaries & Expenses. 1880.	1881.
			$ cts.	$ cts.
42	Andrew Mercer Reformatory for Females and Refuge for Girls, Toronto.—*Continued.*			
	Salaries.	No. of Officers and Employees.		
	Engineer	1	600 00	740 00
	Assistant Engineer	1	.....	400 00
	Stoker (for winter)	1	.....	240 00
	Night Watch	1	.....	400 00
	" (Female)	1	180 00	168 00
	Messenger	1	200 00	200 00
			7,164 00	7,540 00
	Appropriated for above Officers for six months in 1880		3,582 00	.....
	Expenses.			
	Hospital Expenses and Medicines		150 00	150 00
	Butchers' Meat and Fish		1,400 00	2,750 00
	Flour, Bread, and Meal		1,100 00	2,000 00
	Groceries		1,100 00	2,000 00
	Bedding, Clothing, and Shoes		850 00	1,500 00
	Fuel		1,350 00	2,500 00
	Gas and Oil		400 00	660 00
	Water Supply		350 00	.....
	Laundry, Soap, and Cleaning		300 00	400 00
	Stationery, Advertising, Postage, &c		125 00	250 00
	Library, Schools, and Lectures		225 00	400 00
	Furniture and Furnishings		225 00	250 00
	Grounds and Garden		200 00	200 00
	Repairs		100 00	200 00
	Unenumerated		125 00	250 00
	To meet unpaid expenses of previous year		.....	2,530 27
	Expenses for 6 months in 1880, $8,000.		11,582 00	23,520 27
43	School of Agriculture, Guelph.			
	(For 130 pupils, 92 in 1880.)			
	Salaries.	No. of Officers and Employees.		
	President, Professor of Natural History, English, and Mathematics, and Resident Master	1	2,000 00	2,000 00
	Professor of Agriculture and Farm Superintendent	1	2,000 00	2,000 00
	Professor of Chemistry and Practical Chemist (formerly boarded and lodged in College)	1	1,000 00	1,500 00
	Professor of Veterinary Science	1	600 00	600 00
	Assistant Mathematical and Resident Master	1	500 00	500 00
	Bursar and Storekeeper	1	500 00	500 00
	Physician	1	300 00	300 00
	Foreman of Field and Live Stock Department	1	600 00	600 00
	Foreman of Horticultural Department	1	600 00	600 00
	Foreman of Mechanical Department	1	600 00	600 00
	Matron and Housekeeper	1	400 00	400 00
	Engineer	1	500 00	500 00
	Assistant Engineer for 6 months	1	150 00	180 00
	Janitor and Messenger	1	150 00	150 00
	Temporary assistance	..	100 00	100 00
		14	10,000 00	10,530 00

V.—PUBLIC INSTITUTIONS MAINTENANCE—*Continued.*

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	**1881.**
		$ cts.	$ cts.
43	School of Agriculture, Guelph—*Continued.*		
	(*a*) *Expenses of College.*		
	Meat, fish, and fowl	2,800 00	4,000 00
	Bread and biscuit	1,300 00	1,600 00
	Groceries and butter	2,900 00	4,200 00
	Laundry, soap, and cleaning	200 00	300 00
	Women Servants for boarding-house, 16 (12 in 1880)	1,300 00	1,750 00
	Fuel	1,600 00	2,500 00
	Light	300 00	1,000 00
	Furniture and furnishings	500 00	550 00
	Repairs and alterations	650 00	650 00
	Maintenance of chemicals	100 00	150 00
	Advertising, postage, and stationery	600 00	600 00
	Unenumerated	600 00	700 00
	Expenses of Experimental Farm.	22,850 00	28,530 00
	Experimental Department	900 00	900 00
		23,750 00	29,430 00
	Less for balance of board from 130 students $4,000		
	" fees from 150 students 4,500		
		.....	8,500 00
		23,750 00	20,930 00
44	School of Practical Science.		
	Salaries.		
	Professor in Engineering	1,800 00	1,800 00
	Assistant in Chemistry	1,500 00	1,500 00
	Expenses.		
	Chemicals and other material in the different branches	500 00	500 00
	Gas	125 00	125 00
	Fuel	400 00	400 00
	Water	75 00	75 00
	Ordinary repairs	200 00	200 00
	Printing, advertising, postage, stationery, and incidentals	350 00	350 00
	Attendant	450 00	450 00
		5,400 00	5,400 00

VI.—IMMIGRATION.

To be voted per Statement (A).....$41,200.00.

No. of Vote.	A.	1880.	1881.	Compared with Estimates of 1880. Increase.	Decrease.
45		$ cts.	$ cts.	$ cts.	$ cts.
	Agencies in Europe .....(a)	4,600 00	4,800 00	200 00	
	Agencies in Ontario .....(b)	3,350 00	3,400 00	50 00	
	Carriage of immigrants in Ontario.	8,000 00	8,000 00		
	Provisions for immigrants, including medical attendance	9,000 00	9,000 00		
	Expenses of 30,000 pamphlets, compiled with a view of supplying special information for tenant farmers and farm labourers	4,000 00	... .	.....	4,000 00
	Incidentals.....	1,000 00	1,000 00		
		29,950 00	26,200 00	250 00	4,000 00
	Payments to Dominion Government.				
	Dominion Government, to meet proportion of charges for forwarding immigrants from Quebec to Ontario for 1880 (not to be continued after this year)	15,000 00	15,000 00		
	Dominion Government—claim for balance required for same service in 1878 (accounts standing for adjustment)	5,000 00	.....	.....	5,000 00
		49,950 00	41,200 00	250 00	9,000 00

No. of Vote.	SERVICE.	Salaries & Expenses. 1880.	1881.
	Details.	$ cts.	$ cts.
45	(a) Agencies in Europe.		
	Agent in Great Britain	2,000 00	2,000 00
	Travelling expenses, advertising, use of public halls, &c.	700 00	700 00
	Clerk	700 00	800 00
	Contingencies (used principally for printing and distribution of maps, &c.)	300 00	400 00
	Office rent and expenses, including fuel, stationery, postage, cleaning, &c	900 00	900 00
		4,600 00	4,800 00
	(b) Agencies in Ontario.		
	Agent at Quebec	1,000 00	1,000 00
	Travelling and other expenses	500 00	500 00
	Allowance for Assistant and police at Toronto.....	500 00	500 00
	Agencies in Muskoka and Outlying Districts..... ...	400 00	400 00
	Clerk	650 00	700 00
	Travelling expenses, printing, &c., in collecting information for tenant farmers and as to lands for sale and settlement	300 00	300 00
		3,350 00	3,400 00

VII.—AGRICULTURE, ARTS, LITERARY AND SCIENTIFIC INSTITUTIONS.

To be voted per Statement (A).....$106,750.00.

No. of Vote.	A.	Details.	1880.	1881.	Compared with Estimates of 1880. Increase.	Decrease.
			$ cts.	$ cts.	$ cts.	$ cts.
46	Agriculture	(a)	79,150 00	78,300 00	.....	1,000 00
	Arts	(b)	32,500 00	27,100 00	.....	5,400 00
	Literary and Scientific	(c)	1,350 00	1,350 00		
			113,000 00	106,750 00	.....	6,400 00

No. of Vote.	SERVICE.	Voted for 1880.	Voted for 1881.
		$ cts.	$ cts.
	Details.		
	(a) Agriculture.		
46	Electoral Division Societies, 81 at $700	56,700 00	56,700 00
	" 1 at 550	550 00	550 00
	" 6 at 350	2,100 00	2,100 00
	" Outlying Districts	300 00	450 00
	Fruit Growers' Association	1,800 00	1,800 00
	Entomological Society	1,000 00	1,000 00
	Dairymen's Associations	3,000 00	3,000 00
	Agricultural Association	10,000 00	10,000 00
	Establishment of Statistical Bureau	1,000 00	.....
	Poultry Associations	700 00	700 00
	For sundry services in connection with Agriculture and Arts—such as investigations of disease in animals and crops, and of ravages of insects; printing reports and for agricultural instruction, dairy products, and other charges not otherwise provided for	2,000 00	2,000 00
		79,150 00	78,300 00
	(b) Arts.		
	Mechanics' Institutes	27,000 00	25,000 00
	Art Union	500 00	500 00
	Grant in aid of maintenance of School of Art and Design, Ontario	1,100 00	1,100 00
	Special Grant	3,400 00	.....
	Grant, School of Art and Design, London	500 00	500 00
		111,650 00	105,400 00
	(c) Literary and Scientific.		
	Aid to Canadian Institute, Toronto	750 00	750 00
	" Institut Canadien, Ottawa	300 00	300 00
	" Ottawa Literary and Scientific Society (formerly "Athenæum")	300 00	300 00
		1,350 00	1,350 00
	Total	113,000 00	106,750 00

VIII.—HOSPITALS AND CHARITIES.

To be voted per Statement (A).....$78,141.98.

No. of Vote.	A.	1880.	1881.	Compared with Estimates of 1880.	
				Increase.	Decrease.
		$ cts.	$ cts.	$ cts.	$ cts.
47	For Hospitals and Institutions mentioned in Schedule "A" of Statute	44,514 76	47,825 37	3,310 61	
	For Institutions, Schedule "B"	15,891 43	18,026 31	2,134 88	
	For " " "C"	12,426 44	12,190 30	.....	236 14
	To pay for new registers and forms supplied to charities aided under the Act	.....	100 00	100 00	
		72,832 63	78,141 98	5,545 49	236 14

IX.—MISCELLANEOUS EXPENDITURE.

To be voted per Statement (A).....$50,273.73.

No. of Vote.	A.	1880.	1881.
		$ cts.	$ cts.
48	License Law—towards expenses in municipalities where "Temperance Act of 1864" or Act of 1878 is in force.....	2,000 00	2,000 00
	To cover expenses of collection of revenue for law stamps and licenses.	1,500 00	1,500 00
	Marriage Licenses, printing, and incidentals	400 00	400 00
	Ontario Rifle Association	600 00	600 00
	Insurance on public buildings and furniture	1,000 00	1,000 00
	Expenses of elections.....	2,000 00	2,000 00
	" contested elections	1,000 00	1,000 00
	County Court Judges, for expenses of revision of voters' list.....	1,000 00	1,000 00
	To cover gratuities to officers whose services may be dispensed with...	5,000 00	5,000 00
	Mrs. J. W. Bridgland, Widow and Executrix of the late J. W. Bridgland, late Superintendent of Colonization Roads, Superannuation Allowance, based on 25 years service	.....	3,750 00
	Family of A. Holmsted, on dispensing with his services	.....	1,500 00
	Allowance to late Superintendent of Education	4,000 00	4,000 00
	Expenses of printing and advertising, and payments of Examiners, &c., for examination for degree London University and *in re* Gilchrist Scholarship	.....	150 00
	For expenses *re* Boundary Award.....(Re-vote)	10,000 00	10,000 00
	For repairs and care of Brock's Monument.....(Re-vote)	500 00	500 00
	To aid "Sanitary Journal," Toronto	800 00	500 00
	For Telephone Service.....	400 00	500 00
	For expenses of taking lunatics to the Asylums, boys to the Reformatory for Boys, and females to the Mercer Reformatory (to be refunded by Counties)	5,250 00	6,000 00
	Agricultural Commission expenses.....	5,000 00	1,750 00
	Allowance to Counties under provisions of sec. 23, cap. 224, R. S. O.:		
	County of Dufferin $6,000 00		
	" Welland (balance) 557 50		
		.....	6,557 50
	Expenses of preventing prize-fight at Long Point, in May, 1880.....	.....	566 23
		40,450 00	50,273 73

X.—PUBLIC BUILDINGS.

To be voted per Statement (A).....$125,241.00.

No. of Vote.	A.	1881. Re-vote Estimated.	1881. New vote.
		$ cts.	$ cts.
49	Asylum for the Insane, Toronto	300 00	2,730 00
50	" " London	150 00	9,202 00
51	" " Hamilton	500 00	6,660 00
52	" " Kingston	5,750 00	9,850 00
53	Asylum for Idiots, Orillia	.....	1,209 00
54	Provincial Reformatory, Penetanguishene	2,000 00	15,950 00
55	Reformatory for Females	.....	4,300 00
56	Central Prison, Toronto	.....	4,500 00
57	Deaf and Dumb Institute	800 00	5,450 00
58	Blind Institute	500 00	3,650 00
59	Agricultural College	1,200 00	22,550 00
60	Education Department and Normal School, Toronto	.....	2,000 00
61	Normal School, Ottawa	.....	6,000 00
62	School of Practical Science	.....	2,000 00
63	Osgoode Hall, Toronto	.....	1,000 00
64	Government House	.....	4,000 00
65	Parliament Buildings	1,000 00	.....
66	Algoma District	900 00	.....
67	Thunder Bay District	800 00	.....
68	Muskoka District	2,400 00	2,000 00
69	Parry Sound District	400 00	3,250 00
70	Nipissing District	200 00	.....
71	New Territory	3,000 00	.....
		19,900 00	105,341 00
1	Re-votes included in above	19,900 00	
2	Expenditure on Capital Account (new)	91,341 00	Voted for 1880.
3	" for repairs	14,000 00	
		125,241 00	159,775 76

No. of Vote.	SERVICE.	To be voted for 1881.	—
	Details.	$ cts.	$ cts.
49	ASYLUM FOR THE INSANE, TORONTO.		
	Re-vote of unexpended balance	300 00	
	Share of converting old pumping house into a slaughter shed and feeding stable	800 00	
	Furniture and furnishings (Inspector)	1,500 00	
	Materials for removal of plank walks (Inspector)	430 00	
			3,030 00
50	ASYLUM FOR THE INSANE, LONDON.		
	Re-vote of unexpended balance	150 00	
	Repairs of outlet sewer to creek	3,000 00	
	Additional barn space, roof, &c	500 00	
	Furniture and furnishings (Inspector)	3,000 00	
	Materials for hardwood flooring, &c. (Inspector)	1,767 00	
	Exchange of horses and cows, renewal of waggons, harness, &c. (Inspector)	935 00	
			9,352 00

X.—PUBLIC BUILDINGS—*Continued.*

No. of Vote.	SERVICE.	To be voted for 1881.	
	Details Continued.	$ cts.	$ cts.
51	ASYLUM FOR THE INSANE, HAMILTON.		
	Re-vote of unexpended balance	500 00	
	Draining and road making, &c.	1,000 00	
	Frame sheds in airing yards	800 00	
	Furniture and furnishings (Inspector)	2,350 00	
	Materials for hardwood flooring, &c. (Inspector)	1,000 00	
	Horses, cows, farm stock, &c. (Inspector)	950 00	
	Materials for carpenter, painter, &c. (Inspector)	500 00	
			7,100 00
52	ASYLUM FOR THE INSANE, KINGSTON.		
	Re-vote of unexpended balance	5,750 00	
	Additional sum to complete gas works, water supply, &c	1,500 00	
	Fences round Asylum grounds	2,500 00	
	Iron pipes for fire protection and hydrants	3,000 00	
	Furniture and furnishings (Inspector)	2,500 00	
	Purchase money, Graham lot (Inspector)	350 00	
			15,600 00
53	ASYLUM FOR IDIOTS, ORILLIA.		
	Repairs to water tank in building	600 00	
	Furniture and furnishings (Inspector)	300 00	
	Roads and ornamentation of grounds (Inspector)	309 00	
			1,209 00
54	PROVINCIAL REFORMATORY, PENETANGUISHENE.		
	Re-vote of unexpended balance	2,000 00	
	Steam heating, boiler house, chimney, &c	8,000 00	
	Alterations in basement, &c	800 00	
	Outside water closets, drains, &c	1,500 00	
	Water supply connections, hydrants, &c	2,000 00	
	Furniture and furnishings (Inspector)	2,750 00	17,050 00
55	ANDREW MERCER REFORMATORY FOR FEMALES, TORONTO.		
	Front fence and entrance gates	800 00	
	Driving shed	200 00	
	Share of converting old pumping house into a slaughter shed and feeding stable	800 00	
	Furniture and furnishings (Inspector)	2,500 00	
			4,300 00
56	CENTRAL PRISON, TORONTO.		
	Concrete floor in basement, centre building	1,200 00	
	Ice house	500 00	
	Share of converting old pumping house into a slaughter shed and feeding stable	800 00	
	Furniture and furnishings (Inspector)	1,000 00	
	Materials for work by prison labour (Inspector)	1,000 00	4,500 00
	DEAF AND DUMB INSTITUTE, BELLEVILLE.		
57			
	Re-vote of unexpended balance	800 00	
	Root-house and repairs to roof	900 00	
	Furniture and furnishings (Inspector)	1,250 00	
	Bursar's house purchased do	2,750 00	
	Farm stock and equipment do	550 00	
			6,250 00

X.—PUBLIC BUILDINGS—*Continued.*

No. of Vote.	SERVICE.	To be voted for 1881.	
		$ cts.	$ cts.
	Details—Continued.		
58	BLIND INSTITUTE, BRANTFORD.		
	Re-vote of unexpended balance	500 00	
	Furniture and furnishings, music, etc. (Inspector)	2,750 00	
	Equipment, &c., educational department (Inspector)	500 00	
	Road-making, planting, &c. (Inspector)	400 00	
			4,150 00
59	SCHOOL OF AGRICULTURE, GUELPH.		
	Re-vote of unexpended balance	1,200 00	
	To complete buildings, steam heating, etc	5,000 00	
	Water supply from City Water Works	4,500 00	
	Drainage, fencing, etc	2,000 00	
	Implements, shed, etc	2,050 00	
	Live stock, etc	6,250 00	
	Furniture and furnishings	2,000 00	
	Trees, seeds, shrubs, etc	750 00	
			23,750 00
60	EDUCATION DEPARTMENT AND NORMAL SCHOOL, TORONTO.		
	General repairs, drains, etc	1,500 00	
	Alterations in Model School	500 00	
			2,000 00
61	NORMAL SCHOOL, OTTAWA.		
	To complete steam heating, furnishing, planking, etc	3,500 00	
	General repairs, drains, etc	2,500 00	
			6,000 00
62	SCHOOL OF PRACTICAL SCIENCE, TORONTO.		
	General repairs, drains, etc	500 00	
	Alterations in Chemical Laboratory	300 00	
	Road from College Street, east side	1,200 00	
			2,000 00
63	OSGOODE HALL, TORONTO.		
	General repairs, drains, etc	1,000 00	
			1,000 00
64	GOVERNMENT HOUSE.		
	General repairs, drainage, furniture, etc	4,000 00	
			4,000 00
65	PARLIAMENT BUILDINGS.		
	Re-vote of part of unexpended balance—General repairs, etc	1,000 00	
			1,000 00
66	ALGOMA DISTRICT.		
	Re-vote of unexpended balance—Court House and Registry Office, Sault Ste. Marie; Lock-ups on Manitoulin Island, repairs and furnishings	900 00	
			900 00

X.—PUBLIC BUILDINGS—*Continued.*

No. of Vote.	SERVICE.	To be voted for 1881.	
	Details—Continued.	$ cts.	$ cts.
67	THUNDER BAY DISTRICT.		
	Re-vote of unexpended balance—Court House, Registry Office, and Lock-up, Prince Arthur's Landing; and Lock-up at Silver Islet, repairs, furnishings, etc	800 00	800 00
68	MUSKOKA DISTRICT.		
	Re-vote of unexpended balance—Registry Office and Lock-up, Bracebridge, repairs, furnishings, etc	400 00	
	Re-vote—Lock-up at Huntsville	2,000 00	
	Additional amount to provide Court room and rooms for gaoler	2,000 00	4,400 00
69	PARRY SOUND DISTRICT.		
	Re-vote of unexpended balance—Registry Office and Lock-up, Parry Sound	400 00	
	Wood-shed for Registry Office, well, etc	250 00	
	Separate building for Registry Office	3,000 00	3,650 00
70	NIPISSING DISTRICT.		
	Re-vote of unexpended balance—Lock-up at Mattawan, repairs and furnishings	200 00	200 00
71	NEW TERRITORY.		
	Re-vote, Lock-up and house at Moose Fort	3,000 00	3,000 00

XI.—PUBLIC WORKS.

To be voted per Statement (A).....$32,850.00.

No. of Vote.	A.	1881.
		$ cts.
72	Public Works	32,850 00

No. of Vote.	SERVICE.	Re-vote Estimated.	New vote.
		$ cts.	$ cts.
72	Muskoka Lakes Works:		
	Rock blasting on Joseph River and at Coulter's Narrows	.....	800 09
	Dam at Port Carling	.....	1,300 00
	Mary's and Fairy Lakes Works:		
	Pier and boom above lock.....	.....	550 00
	Gull and Burnt River Works:		
	Renewing and repairing dam and slide at "High Falls" (Burnt River); slide at Norland; dam and slide at outlet of "Bob" Lake; Workman's Dam and Elliott's Falls Slide.....	800 00	4,200 00
	Glance pier below Crab Lake Dam	.....	500 00
	Piers at mouth of Burnt River.....	.....	1,500 00
	Re-vote for dam at outlet of Mountain Lake, on condition that all parties whose property is likely to be affected by enclosing or maintaining said dam first agreeing to waive and forego all claims for damages in respect thereof.....	1,500 00	
	Scugog River—dredging, &c.....	.....	5,000 00
	Otonabee River Works:		
	Repairs to dam at Young's Point.....	.....	1,500 00
	Re-vote to meet one-fourth of the cost of proposed bridge and approaches thereto at Des Joachim's Rapids, on condition that one-half of such cost is provided for by the Dominion of Canada, and the remainder by the Province of Quebec, and that the Province of Ontario shall not in any event be called upon to pay more than the sum now appropriated, and that the plans for and construction of the bridge are approved of by the Commissioner of Public Works.....	4,000 00	
	Maintenance locks, dams, and swing-bridges, including new apron for Lindsay Dam, &c.....	.....	3,000 00
	Surveys, inspections, arbitrations and awards, and charges not otherwise provided for	.....	5,000 00
	Superintendent Locks, Dams and Bridges	.....	1,200 00
	Lock-masters', Bridge-tenders', and Caretakers' salaries	.....	2,000 00
		6,300 00	26,550 00
	SUMMARY.		Voted for 1880.
	Re-vote included in above	6,300 00	
	Expenditure on Capital Account (new)	14,650 00	
	" for repairs and maintenance	11,900 00	
		32,850 00	37,400 00

XII.—COLONIZATION ROADS.

To be voted per Statement (A).....$96,500.00.

No. of Vote.	A.	To be Voted for 1881.	
		$ cts.	$ cts.
73	North Division	15,300 00	
	West "	27,500 00	
	East "	29,200 00	
	General purposes	24,500 00	
			96,500 00

No. of Vote.	SERVICE.	To be Voted for 1881.	
		$ cts.	$ cts.
73	I. North Division.		
	Roads in vicinity of Thunder Bay	4,500 00	
	Roads in vicinity of Bruce Mines	3,500 00	
	Batchewaning Bay Road (Indian Department to contribute another $1000)	1,000 00	
	Port Findlay Road (Indian Department to contribute $500 more)	500 00	
	Roads in Manitoulin Island	5,000 00	
	St. Joseph's Island	800 00	
			15,300 00
	II. West Division.		
	Cardwell Road—Repairs	1,000 00	
	Gurd Road—Extension	1,000 00	
	Macaulay Road—Repairs	1,000 00	
	Muskoka Road—Repairs South of Utterson	1,000 00	
	Muskoka Road—Repairs North of Huntsville	1,000 00	
	Muskoka Road—Extension through Strong	2,000 00	
	Maganetawan Road—Extension	1,000 00	
	Mills Road—Extension to West End of Lake Nipissing	3,000 00	
	Muskoka and Bobcaygeon Road—Repairs	500 00	
	Nipissing Road—Extension to S. E. Bay	1,000 00	

XII.—COLONIZATION ROADS—*Continued.*

No. of Vote.	SERVICE.	To be Voted for 1881.	
		$ cts.	$ cts.
73	II.—West Division—*Continued.*		
	North West Road—Extension	1,000 00	
	Lorimer Lake Road—Extension	1,000 00	
	Monteith and Perry Road—Extension	1,000 00	
	Rosseau and Nipissing Road—Repairs from Commanda to Beatty's Creek	3,000 00	
	Rosseau and Nipissing Road—Repairs North of Rosseau	1,000 00	
	Sinclair Road—To extend and build a Bridge	1,500 00	
	Stisted Road—Repairs	1,000 00	
	Northern Road—Repairs South of McKellar	1,000 00	
	Northern Road—Repairs from Mills Road to Commanda	2,000 00	
	Peninsula Road—To complete from Port Sandfield to Parry Sound Road	1,000 00	
	Buck Lake Bridge	500 00	
	Indian Peninsula Road—To complete	1,000 00	
			27,500 00
	III.—East Division.		
	Snowdon Road—To complete to Minden Station and for a bridge over Burnt River	750 00	
	Monmouth Road—(New)	750 00	
	Kirkfield Road—Repairs (Council to contribute $250 more)	750 00	
	Bolsover Road—Repairs	500 00	
	Victoria Road—Repairs (Council to contribute $250 more)	750 00	
	Bobcaygeon Road—To complete to Cedar Narrows	750 00	
	Peterson Road—Repairs to Haliburton Road	250 00	
	Monck Road—Repairs East of Kinmount and West of Bobcaygeon Road	800 00	
	Minden Road—To complete to Haliburton Road	300 00	
	McClintock Road—(New)	400 00	
	Island Road—To extend to Stanhope	300 00	
	Burleigh Road—Repairs South of Apsley	500 00	
	Bobcaygeon Road—Repairs South	400 00	
	Buckhorn Road—Repairs South of Monck Road	800 00	
	Chandos Road—Repairs	400 00	
	Methuen Road—Repairs	300 00	

XII.—COLONIZATION ROADS—*Continued.*

No. of Vote.	SERVICE.	To be Voted for 1881. $ cts.	$ cts.
73	East Division—*Continued.*		
	Anstruther Road—To extend	600 00	
	Tudor Road—To complete	1,000 00	
	Flinton Road—Repairs	500 00	
	Monteagle Road—Repairs	500 00	
	Monck Road—Repairs West of Hastings Road	500 00	
	Mississippi Road—Repairs West of Hastings Road	400 00	
	Peterson Road—Repairs East and West of Hastings Road	500 00	
	Hastings Road—Repairs from Thanet to York River	500 00	
	Hastings Road—Repairs from Peterson Road North	500 00	
	Addington Road—Repairs North of Massanoga Lake	900 00	
	Frontenac Road—Repairs from Gull Creek to Soles	800 00	
	Mississippi Road—Repairs West of Addington Road	700 00	
	Denbigh Road—To Complete	400 00	
	Frontenac Junction Road—To Complete	500 00	
	Anglesea Road—(Repairs)	400 00	
	Barrie Road—To Complete	400 00	
	Addington Road—Repairs from Clare River	300 00	
	Perth Road—Repairs	500 00	
	Vennachar Road	600 00	
	Bonchere Bridge—At foot of Golden Lake	1,500 00	
	Algona and Pembroke Road—To complete	500 00	
	Pembroke and Alice Road—Repairs	600 00	
	Pembroke and Eganville Road—Repairs	400 00	
	Pembroke and Mattawa Road—Repairs	500 00	
	Eganville and Osello Road	500 00	
	Cobden and Eganville Road—To extend	500 00	
	Douglas Road—(New)	1,000 00	
	Opeongo Road—Repairs from Foy's to Shamrock, 28 miles	1,000 00	
	Peterson Road—Repairs from Brudenel to Combermere	1,000 00	
	Hagarty and Brudenel Road—Repairs	700 00	
	Sebastopol Road—Repairs through Lyndock	800 00	
	Horton and Ross Road—Repairs	1,000 00	29,200 00
	General Purposes.		
	Short new roads and repairs	20,000 00	
	Inspection of locations	4,500 00	24,500 00

XIII.—CHARGES ON CROWN LANDS.

To be voted per Statement (A).....$75,000.00.

No. of Vote.	A.	1880.	1881.	Compared with Estimate of 1880. Increase.	Decrease.
		$ cts.	$ cts.	$ cts.	$ cts.
74	Expenditure on account of Crown Lands	73,000 00	75,000 00	2,000 00	

No. of Vote.	SERVICE.	Salaries and Expenses. 1880.	1881.
		$ cts.	$ cts.
74	Details.		
	Board of Surveyors.....	400 00	400 00
	Agents' Salaries, Commissions and Disbursements.....	18,000 00	18,000 00
	Forest ranging and inspection of Timber lands...	14,000 00	16,000 00
	Surveys.		
	Townships north of Lake Superior and Lake Huron, and in the Huron and Ottawa Territory	35,000 00	35,000 00
	Township of Sunnidale (revote).....	1,600 00	1,600 00
	Maps	2,000 00	2,000 00
	Survey of limits in Huron and Ottawa Territory, chargeable against holders.....	2,000 00	2,000 00
		73,000 00	75,000 00

XIV.—REFUND ACCOUNT.

To be voted per Statement (A).....$45,677.49.

No. of Vote.	A.	1880.	1881.	Compared with Estimates of 1880. Increase.	Decrease.
		$ cts.	$ cts.	$ cts.	$ cts.
75	Education...	1,000 00	1,000 00		
	Crown Lands	16,000 00	10,500 00		5,500 00
	Municipalities Fund	16,149 20	24,727 82	8,578 42	
	Land Improvement Fund	11,112 98	9,449 67		1,663 31
		44,262 18	45,677 49	8,578 42	7,163 31

No. of Vote.	SERVICE.		To be Voted for 1881.	
75	Education.		$ cts.	$ cts.
	Account of contributions to Superannuation Fund, withdrawn		1,000 00	1,000 00
	Crown Lands.			
	For payments made to the credit of the Department on account of uncompleted purchases, and afterwards returned to proposed purchasers on purchases not being carried out		7,500 00	
	For two per cent. of Timber Dues, payable to municipalities for timber cut on road allowances		3,000 00	10,500 00
	Municipalities Fund.			
	Balance at credit of Fund, 1st January, 1880		24,454 20	
	Less paid to Municipalities in 1880		14,617 47	
			9,836 73	
	To pay to Municipalities the amount collected in 1880	$18,613 87		
	Less 20 per cent. commission	3,722 78		
			14,891 09	24,727 82
	Vide Stat. Can. 18 Vic. 2 C. and 19 V. c. 16			
	Land Improvement Fund.			
	Moneys collected from sale of Crown Lands, subject to the Land Improvement Fund, for the year ending 30th June, 1880	$9,095 27		
	Less 4-5, leaving 1-5 to the Land Improvement Fund. *Vide* Stat. Can. 16 Vic., c. 159, and Con. Stat. Can. c. 26	7,276 21 / 1,819 06		
	Less 6 per cent. for cost of collection and management	109 14	1,709 92	
	Moneys collected from the sale of Common School Lands, subject to the Land Improvement Fund for the year ending 30th June, 1880	32,008 53		
	Less 6 per cent. for collection and management	1,920 51		
		30,088 02		

XIV.—REFUND ACCOUNT—*Continued.*

No. of Vote.	SERVICE.		To be Voted for 1881.	
			$ cts.	$ cts.
75	Land Improvement Fund *Continued.*			
	To be distributed as follows:			
	¼ to Land Improvement Fund	7,522 00		
	¾ to be added to Common School Fund	22,566 02		
			7,522 00	
	Moneys collected for the sale of Grammar School Lands, subject to the Land Improvement Fund, from 30th June, 1879, to 30th June, 1880.....	926 58		
	Less 6 per cent. for collection and management...	55 59		
		870 99		
	Less ¾, leaving ¼ to the Land Improvement Fund.	653 24		
			217 75	9,449 67
				45,677 49

XV.—UNFORESEEN AND UNPROVIDED.

To be voted per Statement (A),.....$50,000.00.

No. of Vote.	A.	1880.	1881.
		$ cts.	$ cts.
76	To meet unforeseen and unprovided expenses..	50,000 00	50,000 00

SUPPLEMENTARY ESTIMATES.

Estimates of certain sums required for the service of 1881, and to complete the services of 1880.

	$ c.	$ c.
I.—Education:		
1. Normal School, Ottawa—		
Music Master—additional to correct error in amount of salary in Estimates	100 00	
2. Educational Depository—		
Supply of text-books to Model School pupils after 1st July next	300 00	
		400 00
3. Miscellaneous—		
Public school registers—amount underestimated in 1880		425 00
II.—Public Institutions Maintenance:		
Provincial Reformatory, Penetanguishene—		
To cover clerical error in Estimates		1,000 00
III.—Agriculture and Arts:		
1. Thunder Bay District Agricultural Society	100 00	
2. School of Art and Design, London—		
Additional	300 00	
		400 00
IV.—Miscellaneous:		
1. Re-vote of balance from 1880 to aid in establishing a market for Ontario manufactures and agricultural products in European and foreign countries	1,500 00	
To pay rent of warehouse and attendant for three months	270 00	
		1,770 00

V.—Public Buildings:

	$ c.	$ c.
1. Asylum for Insane, Toronto—		
Additional amount for slaughter-house	1,000 00	
2. Asylum for Insane, Hamilton—		
Iron guards to windows and alterations of sashes in two wards.....	1,000 00	
3. Provincial Reformatory, Penetanguishene—		
To complete buildings, alterations, etc. $3,000 00		
Materials for repairs, sidewalks, etc.. 2,350 00		
	5,350 00	
4. Deaf and Dumb Institute, Belleville—		
Desks, maps, charts, and general lessons.....	500 00	
5. Blind Institute, Brantford—		
Furniture, additional.....	450 00	
6. School of Agriculture, Guelph—		
Lumber for cow-stable (labour by pupils)	1,000 00	
7. Normal School, Ottawa—		
To complete furniture and alterations.....	1,000 00	
8. School of Practical Science, Toronto—		
Proportion of additional apparatus in the Department of Chemistry	1,400 00	
9. To rebuild immigration-shed at Gravenhurst	300 00	
		12,000 00

VI.—Public Works:

To meet one-fourth of the cost of repairs to bridge across the Ottawa River, at the Village of Portage du Fort, on condition that one-half of such cost be provided by the Dominion of Canada and the remaining one-fourth by the Province of Quebec, and that the Province of Ontario shall not in any event be called upon to pay for such repairs more than the sum now appropriated.....	250 00

VII.—Civil Government:

Increase in salary of Messenger, Government House..	80 00
Total	$16,325 00

VIII.—Mercer Estate—

Advance on account of Mercer Estate to meet expenditure on Reformatory beyond amount heretofore directed	18,000 00

FURTHER SUPPLEMENTARY ESTIMATES.

Estimates of certain further sums required for the services of 1881 and for certain services in the month of January, 1882.

	$ c.	$ c.
1. Expenses of County Court Judges in grouped Counties (1881), further sum of	600 00	
2. Expenses of Legislation and salaries of the officers of Government and the Civil Service for the month of January, 1882	30,000 00	
		30,600 00

ANNUAL REPORT

OF THE

Commissioner of Agriculture and Arts

FOR THE

PROVINCE OF ONTARIO,

FOR THE YEAR

1880.

Printed by Order of the Legislative Assembly.

Toronto:
PRINTED BY C. BLACKETT ROBINSON, 5 JORDAN STREET.
1881.

CONTENTS.

*The names of Electoral District Societies are arranged alphabetically and printed in capitals, with their respective Township and Horticultural Societies in italics.

PAGE.

ANNUAL REPORT

OF THE

COMMISSIONER OF AGRICULTURE AND ARTS,

FOR THE

PROVINCE OF ONTARIO,

FOR THE YEAR 1880.

To His Honour, JOHN BEVERLEY ROBINSON,
Lieutenant-Governor of the Province of Ontario, &c., &c.

MAY IT PLEASE YOUR HONOUR:

I have much satisfaction in presenting to your Honour a brief statement of the proceedings of the Department of Agriculture, and the reports of the various societies connected therewith, and to be able to speak in more pleasing and hopeful terms, than for several preceding years, of the improving condition of the great interest of this Province, as also of our commercial and manufacturing industries generally. There is now good reason for believing that the late severe depression, which for so long affected this Province and Dominion, in common with most other countries of the world, has at length reached its climax, and that we may fairly look forward in expectation, that by obeying the laws which alike govern the financial condition of individuals and communities, we may, with some degree of confidence, regard the present as indicating the commencement of a reviving, and it is hoped an enduring, prosperity. It is earnestly to be hoped that seasonable and valuable lessons will be learnt from the depression that has been so severely and generally felt. The past few years will teach people to be more careful and persevering in future, and gladly to avail themselves of the ever advancing light which the progress of knowledge and experience is always ready to impart to such as diligently seek it.

The principal cause of the revival we are now experiencing is unquestionably to be traced to the late abundant harvest, with the renewed activity of the great lumber interest, which suffered in duration and intensity unparalleled, perhaps, in our industrial industry. Although in certain localities, of limited extent, the crops may have fallen below an average, yet, on the whole, they proved much above the results realized of late

years, and prices have been obtained of a remunerating character. The live stock of the Province, and indeed of the Dominion generally, have continued to maintain a very healthy standard, and no diseases of an epidemic kind have occurred to prevent our breeders retaining a free and untrammelled communication with British markets. It is, therefore, to be hoped that the utmost vigilance will continue to be exercised to prevent our live stock falling a prey to those terrible epidemics which have unfortunately been so injurious, or rather in some cases destructive of this important branch of agriculture in several European states.

The Commission authorized during the last Session of the Legislature to inquire into the state and prospects of Ontario agriculture, entered early and earnestly on the important duties assigned to it, and the result is the production of a Report containing a large body of evidence, and the careful collation of facts and opinions, that cannot fail to be highly interesting and of great practical usefulness to the farmers of the Province, and indeed to all who feel an interest in the continued progress of the great industry which lies at the foundation of our wealth and prosperity. The Commission evinced much wisdom and discrimination in selecting able and practical men, well versed in the various branches of husbandry, from whom to collect information, including fruit culture and forestry, and invoked the aid of the entomologist relative to the forms and habits of insects injurious or beneficial to the farmer and gardener. The Report, though bulky, is so constructed as to admit of ready reference, and can therefore be easily consulted. It will doubtless, as soon as printed, be widely sought for, not only by the people of Ontario and other Provinces of the Dominion, but by many in the mother country and elsewhere, and cannot fail to attract a large amount of attention to the great agricultural capabilities of this Province, and to influence favourably the amount and character of immigration in the future. Its contents will be found to reflect great credit on the intelligence and patriotic spirit of the various gentlemen who so readily and clearly gave evidence on the different subjects presented to them, while the compilation and arrangement of its several parts equally indicate the ability and zeal of the Secretary.

At the last Session of the Legislature it was deemed expedient to transfer Mechanics' Institutes from the Department of Agriculture to that of the Minister of Education, as being a matter more in accordance with the proper functions of the latter, which already possessed the necessary appliances for carrying out the work with greater efficiency. The number of these useful institutions has considerably increased of late, and require careful supervision; and it may reasonably be expected that ere long they will form an important and efficient portion of our Public School system, which happily may now be said to rank second to none of those belonging to the older and wealthier countries of the world.

Agricultural Societies.

These organizations continue pretty much alike in number as for several years past, and their efficiency and success vary, as might be expected, from various causes, such as locality, differences of soil and climate, and the energy and public spirit of the people, as will, to some extent, be seen by referring to Appendix A. For the purpose, principally, of economizing space, the principal items of receipts and expenditure have, for the first

time, been arranged in a tabulated form, which, while it admits of readier reference, relieves the returns of a considerable amount of heavy and monotonous matter.

It is still to be regretted that so comparatively few societies introduce into their returns a record of facts and results of experience obtained under varying conditions, that could not fail to secure the attention of farmers in general, and which would very much tend to awaken a deeper interest in agricultural pursuits in their relation to both science and practice. I have, on previous occasions, referred to the advantages which might be obtained by members of Agricultural Societies holding a few stated meetings, particularly during the leisure of winter, for considering and discussing the best means of promoting this great interest in their respective localities. In some instances this principle has been practically recognized, and we have a few Farmers' Clubs scattered over the Province which have evidently been attended by beneficial results. No Agricultural Society should regard its work fully and finally done by simply holding an exhibition, as is too commonly the case. Subsequent meetings of the members for reading papers and comparing notes would awaken a very valuable interest in these matters and would exert a beneficial influence, especially on young men, who might thereby be influenced to take a more earnest and rational interest in their pursuits, and strengthen the invaluable habit of correct observation and the formation of sound business principles.

The formation of separate Horticultural Societies under the statute has not, I fear, been generally as successful as the friends of the movement anticipated. In some cities and towns these organizations have done a good work, but in mere villages it can scarcely be expected that, under ordinary circumstances, sufficient material of a varied and suitable character can be procured for a horticultural show of much importance. As most of the Agricultural Societies offer premiums for horticultural products, by increasing the number and value of such premiums the promotion of horticulture might be readily effected without injuring what may be termed the purely agricultural. It is certainly of much importance that proper encouragement should be given for procuring the best specimens of the garden and orchard, which so greatly promote public health and the enjoyments of domestic life.

The Agricultural and Arts Association.

It will be seen by referring to Appendix B that the Annual Exhibition, held in the city of Hamilton, in September last, was attended with the usual high degree of success which for many years has characterized these expositions of the industries of Ontario. The exhibits indicated no falling off in amount, while the quality of many of the most important productions—whether agricultural, horticultural or manufacturing—not only sustained, but in several instances surpassed in excellence, those of previous occasions. The few now living who attended and took an active part in the earlier Provincial Shows can well appreciate the great advance Ontario has made of late years in the products of the field, garden, workshop and manufactory, and much of these improvements may, with justice, be attributed to the influence of the Provincial Shows. It will probably surprise many to be told that during the earlier history of this institution the Directors deemed it expedient to give some pecuniary encouragement to American manufacturers to bring

over to our Provincial Shows some specimens of their agricultural implements, etc., in order to make the Exhibitions attractive, and afford our people suitable patterns, which it was hoped they might copy and improve, by adapting them to our own local wants and uses. Unquestionably the object desired was by degrees attained. Canadian productions soon increased in quantity and much improved in quality, so that in a few years American articles almost ceased to be sent, and became superseded by those of our own manufacture, of more durable construction and cheaper in the end. The large exhibits of implements and machines, and several valuable kinds of manufactures by our own people, which have of late years characterized the Provincial and many local shows, offer a pleasing illustration of the rapid progress made by Canada, and the Province of Ontario in particular, in all the most important departments of national industry. In producing this great change the Provincial Exhibition, it will not be too much to say, has taken a prominent part.

The Council has of late undertaken the formation of ploughing matches on a large scale in different sections of the Province, and in most instances with marked success. This most essential operation of agriculture is deserving the best attention and encouragement that can be given it by our Agricultural Societies generally. During the past year a number of farms in the western section of the Province were selected for competitive examination, and this new field of work has proved most satisfactory, and well deserves continuation. It seems a pity that these and other proceedings of the Council should be confined to newspaper reports, as it would be in the interest of agriculture that they should be carefully collected and appear in a more permanent form.

A feeling seems to be gaining ground in some parts of the country, and by persons much interested in the subject, that the time is fast arriving for revising the statute under which the Provincial Association and Agricultural Societies are organized, with a view of rendering them more effective in meeting the altered conditions of the Province. This important question would have been taken up by the Agricultural Commission, but it was deemed unadvisable to enter on so difficult and weighty a matter at the end of a very prolonged investigation of other subjects. The Government considered that whenever this matter is brought forward for practical treatment it should receive as careful and complete investigation as possible, and consequently that nothing should be done in a hasty or superficial manner. The present statute is constructed on a principle of connecting all the grades of Agricultural Societies on a sort of system, beginning with the Provincial and descending to the Electoral District and Township Societies. Thus it was thought, in regard to exhibitions, that a few specimens of the best articles at a Township Show should be sent to that of the Electoral District, and from which a similar, but larger, selection should be made and transmitted to the Provincial. The theory is by no means unreasonable, but in practice it has been found wanting. It involves the necessity of the different grades of societies holding their exhibitions in a certain order of time, and that a mutual good feeling would exist between the Township Societies and that of the Electoral District, which experience proves does not always exist.

It is now thought by some that we have too many Agricultural Societies, or at least too many shows, an idea that seems to be spreading, and that only Electoral District

Societies, or those even embracing wider areas, should be recognized. The Provincial, all admit, has done a good work, but it is contended by some that circumstances have become so changed that it is already, in some measure, superseded by Central Shows, some of which are not of much less magnitude. Some, on the other hand, contend that it is essential to the highest welfare of the Province, as a whole, that the Provincial Show should continue to visit each great section in turn as heretofore, so that each may periodically partake of the benefits ; and it is further urged that this principle of perambulation is the one which long experience has confirmed by the three great national societies of the mother country, and of several societies of the States of the American Union. It is, therefore, most earnestly to be hoped that our leading farmers and manufacturers will give this intricate question all the consideration which its magnitude deserves, and that when the time for action arrives such changes may be wisely made as will best meet the altered wants and conditions of the country.

Veterinary College.

This institution, in connection with the Agricultural and Arts Association, continues to make steady and healthy progress. It will be seen from the Report that the number of students continues to increase, coming from all parts of Ontario and other Provinces of the Dominion, and several from various parts of the United States.

The course of study is becoming gradually extended, and the standard of examination for diplomas correspondingly raised. Possessing an efficient staff of teachers, and a well-ordered dissecting room, museum, infirmary and library, the College has ample means of imparting to its numerous pupils a thorough veterinary education, both in theory and practice.

Several of the older graduates, practising in different parts of the Province, have been appointed by the Government as Inspectors of Live Stock, with a view that should any serious epidemic occur it may receive prompt and competent attention. These country inspectors, in case of the breaking out of dangerous diseases of a contagious character, communicate at once with the President of the College, the Head Inspector of the Province, who is instructed to lose no time in instituting a thorough investigation of the same.

It is believed that by the vigilant carrying out of these arrangements, in cases of necessity, with the ready co-operation of the owners of the domesticated animals, our farming community will continue to be spared the great, and sometimes ruinous, losses that have been unhappily so largely experienced in the United Kingdom and in other portions of Europe.

Fruit Growers' Association.

By referring to the Report (Appendix C), it will be seen that this Society continues to prosecute its work with steadiness and energy, and it would certainly not be saying too much that the increased desire of late evinced in different parts of the Province for the cultivation of superior kinds of fruit may, in great measure, be traced to its various operations. Specimens of young trees, and plants of new and improved varieties, have

been annually distributed among the members, with a view of ascertaining their suitability to the soil and climate of the various sections of the Province, and the results already obtained have been highly favourable to the improvement and extension of fruit culture in all its branches.

This subject is well deserving increased attention, especially in the peninsula of Ontario, which, from soil and climate, is specially adapted to the successful cultivation of all the more valuable descriptions of fruit. As our great North-West becomes settled a constantly increasing demand will arise for the finer kinds of fruit, that cannot be produced in that extensive region, and so by degrees a large and profitable trade from Ontario may be carried on in that direction, the limits of which, in the future, it would be difficult to imagine. The Society continues to circulate among its members a monthly publication, embracing popular information of a practical character on the various subjects that come within its range, and there is good reason to believe that this little serial has been very serviceable.

It may be proper to remark here that this Association does not now confine its operations to fruit culture, wide as that subject is in itself, but embraces horticulture generally, including forestry and ornamental planting. Papers on several of these subjects will be found in the Report. A wide and most interesting field of usefulness is hereby opened up, and the Society, it is hoped, will do its best to cultivate it with energy, and the lights derived from science and experience. It is difficult to conceive the many benefits that will be derived from public attention being properly directed to these matters, particularly in our rural districts. By the application of knowledge and good taste to the orchard and surroundings of the homestead, by selecting suitable varieties of fruits, and judicious planting, both for ornament and shelter, the wealth of the country will be increased, and our rural landscapes and dwellings, now, after the removal of the primitive forest, too often bald and uninviting, would, by degrees, assume an increasingly attractive and beautiful appearance.

The Entomological Society.

The proceedings of this Society (Appendix D) clearly indicate that during the past year there has been no falling off in the good practical work that has characterized its former operations. Several original papers will be found in the Report, which may readily be used for practical purposes by farmers and gardeners.

We have been fortunate during the past year, with few exceptions, in not having the crops, either of the farm or the garden, seriously injured by insect depredations. As the forms and habits of insects injurious to grain, roots and fruit become better known their ravages, if not wholly prevented, may, in many instances, be greatly mitigated, and a fund of interesting and useful information relating to these matters is to be found in the annual reports hitherto published of this Society. From a careful collation and condensation of the material contained in these reports, going back a number of years, with some necessary additions, a useful manual might be prepared that would be acceptable to all who are engaged in rural pursuits. In such case it would be important to describe insects that are friendly to crops, as well as such as are injurious, as a wanton destruc-

tion of the former may be made from ignorance of the specific functions they perform in the economy of nature. In this respect also the reports of the Society contain much interesting information.

Entomology, as a science, is comparatively new to our Canadian people, but mainly through the instrumentality of this Society, which has one or two affiliated branches beyond the boundaries of the Province of Ontario, quite a number of persons have already become enamoured of the science, and are steadily engaged practically in the pursuit. It is assuring to know that the labours of a few, who have from the first been mainly instrumental in sustaining the Society, are known and appreciated both in Europe and America.

I have much satisfaction in being assured that a few of our younger entomologists in particular have already commenced special investigations of the food and habits of birds, such as are supposed to be either injurious or beneficial to fruits and grain. It is most desirable that such investigations should be duly encouraged, and it will probably be found, after results sufficient in number and accuracy are obtained, that not a few hitherto popular opinions that have come down to us may be totally, or in great measure, without foundation. Here is a wide and comparatively unoccupied field, at least in this country, in which the young and zealous naturalist may obtain profit and renown.

The *Canadian Entomologist*, a neatly executed monthly serial, published by the Society, continues to manifest a vigorous existence, and while its scientific character is known and appreciated both in Europe and America, the popular manner in which it occasionally applies the principles of the science to the practical purposes of life materially enlarges the sphere of its usefulness.

Agricultural College and Experimental Farm.

As the report of this institution is now, for the first time, inserted in this volume—Appendix E—nothing more remains for me to do than to refer very briefly to its present condition and future prospects.

In the first place, I must congratulate the friends of the College on the fact that during the past year it has continued, as heretofore, to make steady and substantial progress. The new President has proved himself a worthy and efficient successor to Mr. Johnston, to whom this institution is very deeply indebted for the progress it made during the critical period of its earlier history. In President Mills' report will be found full information of the work done in what may be designated the inside department, comprising the various subjects of class teaching in all the departments of study, including the domestic arrangements. Professor Brown gives, as usual, a clear and able statement of the outside operations, comprising the farm, garden and workshop. It is assuring to know that the whole teaching staff continue to work zealously and harmoniously in the discharge of their respective duties.

During the past year, large additions were made to the College buildings; the whole of the frontage is now completed, and the dormitories and domestic offices so much increased as to admit of accommodation for 136 resident students. Particulars of these and other matters relating to the course of study and domestic management will be found clearly and succinctly stated in the President's report.

The report of the Professor of Agriculture and Farm Manager will be found, as heretofore, full of information on the farm operations, with the results of numerous experiments in which the agricultural community, in particular, will feel deeply interested. It is an important function of an institution of this nature that great attention should be paid to experimental work, such as testing in the field, cereals, roots, manures, etc., with a view to obtain accurate and reliable results, the extension of a knowledge of which cannot fail to affect beneficially our Provincial agriculture. The same may be said in regard to the breeding and management of live stock. The close and systematic attention which is given, both by instructors and pupils to these investigations, very much enhances the value of the College as a teaching power, and cannot fail to become generally beneficial.

It has been deemed expedient to increase the facilities of teaching and illustrating the principles of Horticulture, in all its branches, including forestry and ornamental planting. For the carrying out of these purposes, an arboretum has been commenced, and more ample provision will be made for the cultivation of plants and flowers; and, for securing the attainment of these important objects, it will be necessary to erect a capacious conservatory, with suitable propagating houses, adapted to existing wants, and constructed in accordance with the present advanced state of garden architecture. The cultivation of fruit will also receive special attention, with particular practical application to the wants and suitability of the various sections of this Province: and for these purposes the Horticultural Instructor will receive the valuable aid of some of the leading members of the Fruit Growers' Association. The raising and testing of trees and shrubs for the purpose of planting, either for shelter or ornament, or for both, will receive special attention, and will lead ultimately, by enlisting other agencies, to the efficient meeting of pressing and wide-spread wants.

Considering that this institution has been in existence only some half a dozen years, and the difficulties which accompanied its inauguration, its present advanced condition can only be regarded as a matter of sincere and hearty gratification. Each succeeding year of this brief history has been marked by a progressive advancement, not merely in the number of pupils, but also in the enlargement of the course of study pursued, and raising the standard of examination. Much, no doubt, yet remains to be done, and which will, doubtless, in due course, eventually be accomplished, by utilizing the knowledge gained by experience, and by winning increased public sympathy and support. In this way it is devoutly hoped that our Agricultural College will continue to increase in practical usefulness, and remain, through coming generations, an enduring monument of the intelligence of the people and the patriotism of their legislators.

Dairymen's Association.

It is generally known that this body, organized under Statute, is now divided into two sections, one embracing the Eastern Division of the Province, and the other the Western; so that there are two distinct societies pursuing the same object, each of which publishes annually a report of its proceedings, and between which the Legislative grant is equally divided.

These reports contain much valuable and interesting information on the state and

prospects of Ontario dairying, and clearly demonstrate the sound and rapid progress that has been made of late years, since the co-operative principle has been adopted, particularly in the production of cheese. Articles of a scientific character contained in these reports will often be found of a high and original character, and the application of scientific principles to the practical work of the dairy is generally treated in a lucid and interesting manner, so as to elicit inquiry and lead to correct observations on the most important branches of dairying as a practical art.

It is encouraging to find that increased attention is being paid to the improvement of the *quality* of Canadian butter, a matter of urgent importance; and that the co-operative principle pursued in a few localities has already been attended by very marked success. There is, indeed, good reasons for believing that by adopting the right means, similar to those which have produced already such beneficial results in the manufacture of cheese, the quantity and quality of our butter may become in like manner advanced, and therefore add materially to the developed resources of the country. The breeding and management of dairy stock, with the various manipulations of milking, cheese and butter making, are familiarly described in the transactions of these two associations, and I hope to be able in future to incorporate in my report, in a condensed form, several of the more salient points of these interesting articles, for the particular benefit of such as are practically engaged in dairy pursuits.

The cheese business experienced during the past year a very gratifying revival from the extremely depressed, though very temporary, condition that prevailed previously; and as trade and commerce revive in Britain, particularly, the demand for cheese and butter will continue to increase and a profitable trade sustained, with the understanding, always, that we supply a really good article, adapted to the taste and wants of customers. Prices of dairy products are now such as to offer strong inducements to manufacture the best qualities, and in this, as in other pursuits, it will be found that success will mainly depend on keeping pace with the wants and progress of the times. Our cheese has already obtained a good position in British markets, and by adopting the right means there can be little doubt that a similar position may, in a few years, be won for butter. Besides, as our home population increases, so will the demand for dairy products; and cheese, which supplies in a condensed form a large amount of muscle-repairing materials, will obtain a much greater demand, especially from such as are daily engaged in bodily and out-of-door labour. It is a cause of regret, that a taste for merely new cheese continues still so prevalent among our people, as it has been shewn by the highest scientific authority that the best manufactured article requires a certain length of time to mature or ripen; a condition in which it possesses the largest amount of nourishing constituents, in a condition best adapted to the important functions of digestion and assimilation.

Ontario Poultry Association.

It will be seen by a reference to the brief report of this Society, Appendix F, that the exhibition held in Guelph early in the year of 1880 was highly successful, indicating steady and healthy growth. The number and quality of the various kinds of poultry afforded visitors a useful and interesting study, enabling them to distinguish the

leading characteristics of the different breeds, and to form some definite idea of their relative adaptation to special markets and local conditions.

As stated in the report, the poultry interest is by no means the insignificant thing which many people, who have not paid sufficient attention to the subject, are inclined to imagine. In France, poultry and eggs, have for a long period of its history, formed no inconsiderable portion of the national income; and with an enlightened desire to improve and extend the varieties of poultry best adapted to the physical conditions of the Province of Ontario, the most valuable results would naturally follow. In the present depressed condition of agriculture, even in Britain, it is seriously urged among the different sources of relief that farmers generally should pay more attention to the raising of poultry, an interest that has been too long and widely neglected, especially by agriculturists of the larger class. The importation of eggs alone from the Continent into England represents an annual money value of which comparatively few persons have any adequate conception With improved and cheaper modes of transit so characteristic of the present age, we are justified in assuming, that by raising poultry of superior quality in this Province, both for flesh and eggs, we will be enabled, not only to meet our own ever-increasing demands, but also to export whatever balance may remain to the neighboring States and the mother country, thereby continually adding to the wealth of the Province.

I trust, therefore, that the directors of this society will, in their future reports, give such reliable and detailed information on the breeding and management of poultry as will induce our rural population to take a deeper and wider interest in the matter.

In consequence, mainly, of the almost unprecedented depression of agriculture in the United Kingdom, a number of experienced farmers were delegated to visit the Dominion the past year, with a view of ascertaining, from personal enquiry and observation, the advantages it possesses as an extensive field for emigration. I feel disposed to insert an extract or two from the report of Professor Sheldon, a copy of which has just come to hand. Mr. Sheldon, it will be remembered, made last fall as large a tour of the Dominion as was possible during the limited time that was at his command. The Professor, occupying a foremost position in England as a practical farmer, author and teacher, his report will be looked to, by thousands interested in the subjects treated of, as an authority. He speaks in very commendatory terms of our Agricultural College, and seems to have been pleased with the few exhibitions he had an opportunity of attending. It is to be hoped that the suggestions for further improvements, contained in the report, will not be lost sight of by our people:—

"The western portion of Ontario may be regarded as the garden of the Dominion literally as well as figuratively the garden, for it is there that apples, pears, grapes, peaches, melons, and the like, grow in the greatest profusion, and with the least trouble on the part of the farmer. Every farm has its orchard, and it is purely the farmer's fault if the orchard is not an excellent one, for the climate and the soil are clearly all that can be desired, and the trees will do their share of the work, provided that the right sorts are planted. It is usual to plant out peach and apple trees alternately and in rows in a new orchard, and the apple trees are at the distance apart which will be right when they are full-grown. This is done because the peach trees come to maturity first, and have

done bearing before the apple trees require all the room; the peach trees are then cut down, and the apple trees occupy all the room. These trees are planted in rows at right angles, so that there is a clear passage between them whichever way we look, and the land can be freely cultivated among them. It is, in fact, usual to take crops of wheat or oats or maize from the land during the time the trees are young, and we often saw fine crops of golden grain overtopped by noble young trees laden with fruit. A farmer may not, of course, look to fruit alone to grow rich on, but he often nets a nice roll of dollars out of it, and to say the least, it is conducive to happiness to be well supplied with fruit, while to live in a climate and on a soil that will produce it abundantly is always desirable."

The Professor reports most favourably on the capabilities of Ontario for grain-growing and stock-raising, likewise for dairy-husbandry on the factory system :—

"The dairy cattle in some parts of Ontario will compare not unfavourably with those of many parts of England. Shorthorn grades prevail, and it may be said that, wherever a better class of cattle are found, the improvement is due, as a rule, to the Shorthord element. In the magnificent herd of pedigree Shorthorns at Bow Park, I found a collection of animals which, for number and quality, cannot in all probability be equalled elsewhere. It is clear that the climate and soil of Canada are well suited to maintain the purity and vigour of these animals, and there is every indication that they have not deteriorated in any respect, but the contrary, in their new home in the far west. There are some 300 animals on the farm, forming a herd that is well worth crossing the Atlantic to see. I spent three days at Bow Park, enjoying the company of my worthy friend, Mr. Clay, and I should have liked to have spent as many weeks, or even months, in order to become familiar with the many beautiful Shorthorns I saw there. Canada has in her midst, then, the largest herd of pure-bred Shorthorns to be found, and she ought to make an extensive use of it to improve the bovine stock of the country, with the view of developing the new fat stock trade which has sprung up with England. But, Mr. Clay complains, and not without reason, that the Americans are a head of the Canadians in appreciation of good stock, and that the greater portion of his young bulls have to find a market in the States. This ought not to be so, and it is no feather in Canada's cap that such a complaint should be made"

It must be a source of justifiable pride to all true hearted Canadians that the Province of Ontario possesses the largest and best herd of Shorthorns probably in the world, a monument of the public spirit and indomitable energy of its originator, the late and lamented Hon. George Brown. Most earnestly it is to be hoped that Canadian farmers will soon more adequately appreciate the great advantages which this immense breeding establishment offers, and turn them to a practical account. With another extract I must close :—

"It is said that Canada is the place for a poor man, and this, no doubt is true, but it is also the place for a man of means, for capital tells a tale there. It is not probable, however, that many farmers of capital will face the ills they know not of in Canada, and, indeed, I would not advise any one to go there who is doing well in this country; but, then, it is hardly fair to Canada that only poor men should go there as farmers, for money is wanted to develop the riches of the soil, not labour only. I know farmers in England who toil year after year, and live very carefully, without being any forwarder at the year's end than they were at its start. This sort of thing to me seems very hopeless, and I would say to such men, "You will get along faster in Canada." There is not and has not been a better time than the present for English farmers going to Canada. Canada is just recovering from a period of depression, during which the value of land has become reduced, and so it happens that many of the farmers of the lower Provinces are looking wistfully at the wonderful prairies of the North-West, and are anxious to sell their present farms, and go there with their rising families. They, it is true, are fittest to go, and it seems to me

a nice arrangement that English farmers of capital should take their places, as they seem to me well calculated to carry out the systems of farming which are needed, viz., the restoration of fertility to the soil. Many English farmers (particularly those whose capital is small) if we accept the oldest ones, would do well in the North-West, yet in the lower Provinces they would find farms and homes more in keeping with those they leave behind in England. Their sons in turn will move in the direction of the setting sun."

Respectfully submitted,

S. C. WOOD,

TORONTO, February, 1881. *Commissioner of Agriculture.*

APPENDIX TO REPORT

OF THE

Commissioner of Agriculture and Arts.

APPENDIX (A).

ANALYSIS OF REPORTS OF AGRICULTURAL AND HORTICULTURAL SOCIETIES FOR 1879.

ANALYSIS OF REPORTS

OF

Agricultural and Horticultural Societies

FOR THE YEAR 1879.*

BRANT, NORTH.

The President and Directors of the North Brant Agricultural Society beg leave to present their Annual Report for the past year.

We regret to have to report that the late Treasurer was in default the sum of $745.04, and after entering a suit against his sureties and incurring considerable expense, we were advised by our solicitor to compromise with said sureties. A committee of three of the Board was appointed to effect a settlement, and they have accepted the sum of $250 and released the sureties. By this defalcation the Society has lost (after adding costs) the sum of $562.52.

A mowing-machine trial (under the auspices of the Society) was held on the 2nd of July, on the farm of P. H. Cox, Esq., which was very well attended.

The Annual Exhibition was held on 2nd and 3rd of October, and was very successful. The exhibition of horses was very large, and many of them were of a superior description. The exhibition of cattle was not quite so large as last year. Sheep, pigs and poultry were numerous and of excellent breeds and quality. Of carriages there were quite a number; but of agricultural implements, we are sorry to say, there were very few compared with former years. The hall was not very well filled, but would compare favourably with other years in many respects.

The receipts at the Fall Exhibition amounted to the sum of $387.66, being $12.44 in excess of 1878, and $24.59 in excess of 1877, which shows that the Society is progressing financially yearly, if it is but to a small extent.

The entries of stock and produce may be enumerated thus, viz.:—Horses, 311; cattle, 107; sheep, 147; pigs, 93; poultry, 244; grain, 42; dairy, 64; roots and vegetables, 129; plants and flowers, 60; fruits, 211; carriages and implements, 36; harness, etc., 8; ladies' department, 158; factory, 5; mechanical work, 20; discretionary, 33; in all 1,668 entries, being 253 less than those of the preceding year.

In conclusion, your Directors would respectfully urge (as was done in the report of last year) the necessity of taking a greater interest in the progress of this Association, by coming forward earlier in the year and giving their subscriptions to the Directors, as it is absolutely necessary for subscriptions to be paid in the early part of the year, in order to enable the Directors to apply for the Government grant at the proper time.

* The names of Electoral District Societies are arranged alphabetically and printed in capitals, with their respective Township and Horticultural Societies in italics. Financial particulars will be found in a abulated form at the end of this appendix.

BRANT, SOUTH.

The Directors of South Brant Agricultural Society in submitting this, their Annual Report of their proceedings for the past year, desire to congratulate the members of this Society on the success attending their efforts to continue the Brantford Southern Fair in a high position as an Agricultural, Mechanical and Industrial Exhibition. Their success in this respect has been universally acknowledged, and exhibitors have come from all sections to show their productions with us.

In reviewing the proceedings for the year it would be as well to mention that early in the year the Directors held a show of entire horses, yet only ten entries were made, and the show was comparatively a non-success.

The falling in of the roof of the sheep and pig pens was a matter which brought a direct loss on the Society, yet to a much smaller amount than they at first anticipated; the direct loss for replacing the roof being about $45. The total cost was about $120, of which $75 was subscribed by the builder.

The Directors having been solicited to hold a celebration of July 1st, Dominion Day, by holding games, etc., on the Fair Grounds, concluded to do so, as it was desirable to add every dollar possible to the Society's funds. The games, etc., took place and were moderately well patronized. The result was not a loss, but the gains were very small.

The Fall Exhibition, or Southern Fair, was held on the 7th, 8th, 9th and 10th of October, and was in every respect a marked success. The entries exceeded those of last year, and numbered over 6,000, every department being well represented; the most marked increase being in agricultural implements and machinery. The show was fully equal to any other fair held in Ontario. One drawback to the success of the Fair was the wet and stormy weather of Wednesday, the 8th October, which was a serious blow to the financial receipts. In speaking of the Exhibition, your Directors desire to thank the citizens of Brantford and the various implement manufacturers for their liberality towards the funds of the Association, both in cash and goods.

Your Directors would also desire to draw attention to the central brick building, which has been found totally unsuited for the purpose for which it was built, and would urge upon this meeting, and the Directors of 1880, the desirability of enlarging the building by extending two or more of the wings for about fifty feet each, and adding an upper story to the extension. This will have to be attended to at an early day, should the Society continue to hold yearly exhibitions of the increasing magnitude of the Brantford Southern Fair.

Your Directors would also desire to draw the attention of this Society to the case of Chas. Grant, of Thornbury. This party made a large exhibit at your Society's Exhibition in 1878, and took many valuable prizes, but was accused by protest of showing articles other than of his own growth, and other matters. A committee was appointed to examine into these charges, and reported to the Board that they had examined into the matter and that affidavits had been made sustaining the charges, and they recommended that no prizes be paid Grant. Their report was adopted by the Board, who had full knowledge of the facts of the case. During the early part of 1879, Grant again made application for payment of these prizes, and threatened to sue the Society if his demands were not complied with. A committee was again appointed in the matter, who reported, sustaining the report of the committee of the previous year. After this Grant sued this Society, and was non-suited by the Judge. Grant now writes stating that if the money is not paid he will bring the matter before the Commissioner of Agriculture, asking him to compel this Society to pay him. The matter now stands in this position, and your Directors desire an expression of opinion on the matter from this meeting.

Your Directors would also congratulate the Society on its financial position, the affairs having been conducted with great economy this year and yet under many disadvantages. Last year this Society received $1,075, in grants from the various municipal councils, and this year we have received only $100. Our gate receipts were this year fully $200 less than last year. At the end of last year this Society was about $450 in debt, besides the Cockshutt mortgage. The end of our financial year finds the Society

indebted to the amount of $612, which amount includes a note due Mr. Grantham of $310, of last and previous year's incurring; showing under the many adverse circumstances surrounding us a falling behind of about $150 on the year's transactions. This amount would have been made up many times over if we had had a fine day on the Wednesday of exhibition week. * * *

BROCKVILLE, E. D.

Your Directors, in presenting this, their Twenty-fifth Annual Report, have much pleasure in congratulating the Society on the marked success of the year's operations. Profiting by the experience of former years, and feeling that more room was required in which to properly display the articles entered for exhibition, your Directors procured the erection of an addition to the main building, making the room now amply sufficient for all purposes. They also caused to be erected about seventy-five cattle-stalls, which, from the generous conduct of some of the officers and members in hauling the lumber free of charge, and by assisting in their erection, very materially aided in lessening the cost of their construction. They also paid half the expense of sinking a well for the supply of water for the stock and teams; this was a much-needed improvement, and one that was cordially received. The Directors have the proud satisfaction of handing over to their successors in office one of the best appointed and commodious fair-grounds in Central Canada.

The Board feel a pride in reverting to our Annual Exhibition for 1879. It was a success far surpassing anything of the kind held before by this Society, and, as a whole, creditable to exhibitors of every class who took part in it; and while speaking in general terms of the exhibition, we must not forget to make especial mention of the display made by the lady members of the Society. In every department of the ladies' work, and domestic manufactures, the exhibits were fully up to the standard of former years, and in some classes far surpassed anything before exhibited, both in quality and quantity. In fact, the ladies' department surprised and delighted the visitors, and was in itself a display that for richness and variety is not often surpassed. In no department was there such spirited competition, not for the amount of prizes awarded, but solely for the honour and the desire to render the exhibition more attractive. We should be glad to see the same spirit manifested in other departments, especially among the farmers, whose institution it is, and who should be influenced more by the desire for improvement than by the dollars and cents awarded. In every department of the exhibition there were shown very creditable specimens of agricultural industry and skill. The show of horses was generally considered to be superior to last year. The number and quality of the sheep and swine exhibited was also good. The display of poultry was considered to be above the average, some very fine birds being on exhibition. The cattle shown were above the average, some splendid animals of the Alderney or Guernsey breed being exhibited; also about the usual quantity and quality of Ayrshires, Durhams, and grades. The arranging of them in the stalls erected for that purpose very materially added to the success of this department, as the cattle were shown to better advantage, as well as saving the exhibitors the trouble and annoyance of looking after their stock when shown in pens as formerly. The display of grain and roots was excellent. Apples were shown in abundance, clearly proving that this section can produce excellent samples of fruit if properly cultivated. The display of flowers was really splendid; no doubt this department was stimulated by the splendid special prize by the Hon. C. F. Fraser. The labour-saving machines were excellent of their kind. One feature of this department gave your Directors especial pleasure: that was the interest manifested by the manufacturers in showing their implements and machines themselves, instead of leaving it to agents and purchasers to introduce them, one enterprising firm, Copp Bros. & Co., of Hamilton, having sent a full supply of ploughs, cultivators, horse-hoes, corn-shellers, &c., in special charge of their general agent, with the express purpose of showing them to advantage at our Fair. Nor must we forget to mention the splendid display of agricultural implements shown by Cossitt & Bro., of Brockville, who had especially fitted up a full line of their manufactures for exhibition at Unionville.

Frost & Wood, Smith's Falls, also made a fine display of the implements made by them, including rakes, ploughs, straw-cutters, etc. J. W. Mann & Co., Brockville, exhibited a new labour-saving machine, being an attachment to horse-rakes, for sowing all kinds of grain and seeds, which was shown in operation on the grounds. From the manner in which it did its work, and the favourable comments made by the farmers, it seemed to be considered just the machine for the times. Other manufactures were also represented, including ploughs, cemetery fencing, etc., by Mr. McNish, of Lynn; mowers and reapers by the Kirby Manufacturing Co., Brantford. Toronto Mower Co., etc. Taken altogether, the exhibition of 1879 was pronounced by judges and visitors to be equal, if not superior, in every department to any ever before held by this Society. The number of entries were some 400 in excess of 1878, having reached the total of 2,968. The number of members has increased in like proportion, and the attendance of the general public was fully as large as heretofore. It is for the members in general, by further improvement in every branch of their calling, to make the Annual Exhibition of this Society still more attractive, so that it shall become an object of ambition to every farmer in this section to become a member of this Society.

The fourth annual ploughing match, under the auspices of this Society, took place on the farm of Jonas W. Hough, at Fairfield East, and from a variety of causes might be said to be almost a failure, for amongst all the good ploughmen in this district only six members of this Society competed. On all sides might be seen men looking on and criticizing, who ought to have been competitors and setting the young men of this district an example worthy of imitation. If the ploughing matches are to be continued, we would suggest that important changes be made in the prize-list as well as in the manner of conducting them.

Your Directors regret to state that during the year they have lost the services of two of their chief officers. The first in the person of the second Vice-President, Dr. J. H. Morden, of Brockville, who was suddenly stricken by death in July last. Your Directors, at the first meeting thereafter, unanimously elected Daniel Blanchard, Esq., of Greenbush, as his successor. They also regret that, by the removal of the President, Dr. G. W. Edwards, to Napanee, the Society has lost one of its ablest members. For five years he held the office of President, being each time elected by acclamation, and we feel called upon to record our appreciation of his untiring exertions to further the interests of this Society as well as of his urbanity and gentlemanly disposition, for we know that in Dr. Edwards the Society has lost a warm friend and a gentleman in every sense of the word.

In conclusion, your Directors return to your keeping the trusts reposed in them one year ago, and in doing so would sincerely hope that the success that has attended the operations of this Society in the past, may be an incentive to greater exertions to make this the Model Fair of Canada; and in order to make it such, it is desirable that the members of the Society should take a warm and active interest in promoting its objects. By so doing it tends to bring all classes of the community together, promotes harmony and good feeling, improves the morals of the young, refines the mind, and creates a taste and desire to plant and beautify our homes and surroundings. A kind Providence has given the means within the reach of all to possess and enjoy such pleasures, and all that is required on our part is to prepare the ground and plant the seeds. He who governs all things will water the earth, and cause the seeds to grow, sending forth well-formed plants decked with flowers of rich and brilliant shades, from which ascend perfumes of most exquisite fragrance; this, too, without any arduous study or labour on our part.

CARDWELL.

1880 is upon us, which is prophesied to be an eventful year; and while we find agriculturists in Great Britain in a depressed condition, our own dear Canada is smiling over the fruits of a bountiful harvest. We also endorse the sentiments of the Lieutenant-Governor, and hope that the Government will, during the present year, place the claims and advantages of the Province of Ontario favourably before that portion of the population of the United Kingdom so as to induce farmers to emigrate to Canada.

In submitting the report your Directors have much pleasure in congratulating you on the pleasing and satisfactory results of the financial and other affairs of the Society.

In July last, a union was effected with the Board of the Township of Tecumseth Agricultural Society on the following basis: That each Society put in one-half, and bear one-half the expense; and when one or other of the societies withdraws, that the funds then on hand be equally divided.

Our Fall Show was held in the Village of Beeton, on the 15th and 16th of October, and the very great number of entries on that occasion proves that a great interest was taken in our show, notwithstanding the general dissatisfaction given on previous years. The weather was not altogether favourable, but in every respect the show was a grand success, as was testified to by many officers of other societies, amongst whom was Mr. Graham, the Provincial Society Treasurer, who spoke in high terms of it.

Your Directors have also much pleasure in stating that our Prize List was the most complete of any of the surrounding societies. There were over 2,000 entries, and the amount of prizes awarded and paid by your Treasurer is $965, nearly double what had been paid in former years.

At the Spring Show there was a large turn out of stock, of which the principal part was imported.

Since the shows have been held at Beeton, they have given general satisfaction, except to a few about Mono Mills, which latter place is situate partly in Dufferin.

We have excellent grounds and hall, and the best accommodation for shipping stock and also for bringing visitors, being enabled to secure special rates on the main line and branch of the Hamilton and N. W. Railway. We have also good accommodation for exhibitors in the way of hotels.

And your Directorate hope that the union will continue during 1880 as the funds are still merged; and can see no reason why the township of Adjala at all events should not also come in; those from that township who were competitors for 1879 secured a fair and proportionate measure of success as prize takers.

CORNWALL, E. D.

At a meeting of the Directors, held on the 15th day of January, 1879, A. P. Ross was appointed Treasurer, and Robert Anderson, Secretary, at the usual salary.

A meeting was held on the 12th day of April, when the members of the Turf Club stated that they wished to give up the lease of the Exhibition Grounds, as they could not pay the rent promised in the agreement, when it was agreed to forgive the balance of rent due in full payment for the buildings they had erected upon the grounds, and that they, the Turf Club, keep the grounds for a term of three years, at a rent of $140 per year, subject to the conditions of the old lease. The treasurer was instructed to pay the interest due Thomas Doyle, on 1st day of May, in full if possible, and if he was short of money to give note for balance; and he was also instructed to place all accounts due for services of the horse Sultan in hands of the Bailiff for collection.

A meeting was held, by order of the president, on the 26th day of July, for the purpose of consulting about holding an exhibition, when the meeting was adjourned until the 23rd day of August.

A meeting was held pursuant to adjournment, when it was decided that it would be much better to have no exhibition this year, and take all the available funds to pay off part of the debt of the Society. * * *

DUNDAS.

Address of the President, and Annual Report.

I am about to occupy a position that I did not expect I would be called upon to fill, but on the death of our much respected and lamented President I have been selected to occupy his place.

We, as citizens and as an Agricultural Society, have sustained a loss by his death that will not be very easily repaired. He was a kind, obliging, unpretentious neighbour, and as an agriculturist and stock raiser second to none in Eastern Ontario. He always took an active interest in the Provincial as well as our local fairs, and being an extensive exhibitor, contributed largely to the interests of our Society; his exhibits always being very attractive, and one of the principal features of our Fair. Let us imitate his virtues, and may his ashes rest in peace.

The Dundas County Agricultural Fair for the year 1879, is now about being brought to a close, the President's address being about the last performance upon our programme; and in attempting to address this large and intelligent audience I feel as though I were not equal to the task. However, I would not be doing my duty if I did not make an effort.

The Giver of every good and perfect gift, has seen fit to again bless us with peace and plenty, for which we ought to feel thankful. The harvest has been abundant, particularly hay and fall wheat. For the breadth of land sown to fall wheat, the yield would compare favourably even when our country was in its infancy. Spring wheat is a little below an average, but barley, oats, corn, and the root crops are good. Prices of all kinds of dairy and agricultural products are low, compared with former years; and farmers in a good many instances, on account of the remunerative prices received for their products heretofore, and with the expectation of their continuance, have over-reached in buying land and in building, and have in consequence involved themselves in difficulties; but those who have acted prudently, do not feel the hard times as severely as the class I have just mentioned, and also men of other professions.

I am happy to report the entries and exhibits as nearly up to any preceding year, but I am also sorry to report that financially there is a deficiency. Now, brother farmers, why should this occur? Is not this Agricultural Society intended for our benefit? Would we not receive ample remuneration for our time spent at our Fair, and for our membership fee, although we did not receive a cent in premiums upon our exhibits? I contend we would, if in no other way than by an exchange of ideas with our friends upon agricultural topics, and a close observation of exhibits that are of personal interest to us. It is, or at least it should be, the bounden duty of every farmer and mechanic in this fair Dundas of ours, to encourage our Agricultural Society.

Look, if you please, at the amount our Local Legislature grants yearly for the encouragement of agriculture, no less a sum than $100,000, they knowing full well that by the encouragement and promotion of agriculture, the wheels of the whole machinery will be kept in more rapid motion. We ask for renewed zeal from the farmer and mechanic in the promotion of our Society, that it may not dwindle into insignificance. This Society derives no benefit from the fact that the county of Dundas has all the requisites for success, and the promotion of agriculture, yet if the fee simple holders pass by on the other side and give us no aid, the burdens of the Society must be cast upon a few individuals, while every farmer and mechanic in the county should have pride enough to induce them to take part with us in our efforts to improve our agriculture, horticulture, and household manufactures. If we should receive aid as we are entitled to, we might make this Society what it should be, second to none in the Dominion of Canada.

How frequently we hear agriculturists complaining of the hardships they have to endure; but just let us contrast the position of the agriculturists of to-day, with that of the little band of U. E. Loyalists, who being true to their king and country, tore themselves away from social life, and leaving beautiful homes, took up their abode on the banks of the St. Lawrence in this county, in the year 1784. If there be any class of men entitled to grateful remembrance by us, for their patient enduring toil, for their daily sacrifice of bone and sinew in conflicts, renewed from day to day, to change the dense forests into beautiful cultivated fields, and prepare the way for future generations, such are they who made the first marks of agriculture in this country. They struggled, they desponded, they bowed the mighty oak and towering pine; and what was their outfit for this mighty work? An axe, knapsack laden with a change of coarse apparel, a scanty supply of provisions, and a musket, to help supply their scanty store from the surrounding forests. No cloth was laid, no bed was spread for them, save that which

nature prepared for the wild beasts that surrounded them. Such were some of the hardships and privations the first settler had to endure.

Every year since Canada was first settled the genius of mechanism has been at work, and has brought agricultural implements to such perfection, that the work of the farm would be considered by the class of men I have just mentioned as mere recreation. But notwithstanding the advantages that we now have within our reach, many we hear complaining of hardships, and are making a retrograde movement. Now, brother farmers, this last is not as it should be; we must have a policy of our own, or consent to be dictated to as to the progress we make. We will soon find out that in the division of profits others get the lion's share. How will we meet this overshadowing power? Not by quietly allowing other minds to think for us. We ask no unequal privileges; we seek not to crush any other department or investment, but we do ask for co-operation, and an equal division of profits. Our motto is, Live and let live.

And now, in conclusion, we return our most sincere thanks to the ladies, knowing, as we do, that without their co-operation our Exhibition would soon become a failure.

Thanking you for your kind attention, I will now ask for three rousing cheers for the Queen.

DURHAM, EAST.

The Directors take this opportunity to thank the friends and patrons of the Society for their liberal support during the past year, especially those subscribers residing in Port Hope, as these have nothing to gain directly by the Society. Their subscriptions are given for the purpose of encouraging the Society, arising, no doubt, from a feeling of reciprocity with the agricultural interest.

The Exhibition of this Society was held in connection with the Township of Hope Society, in the new Agricultural Park, at Port Hope, in October last, and may be termed a fair display of the stock and agricultural, horticultural, mechanical and industrial productions of the riding and surrounding country; the Show being open to the Province of Ontario. The competition in some of the classes was very keen, while in others it was not so animated. The sum of $1,000 was offered in premiums; of this amount $750 was awarded.

The Exhibition of the Central Association No. 5, was held at Peterboro' a few days previously, and the United Exhibition of West Northumberland and the Township of Hamilton, was held at Cobourg a few days afterward. This, no doubt, detracted more or less from your Exhibition.

The founders of the Central Association thought that their exhibition would do away, in a great measure, with the local shows. But this has not been the result. The riding and township societies continue to hold their shows just as persistently as ever. Financially your Exhibition was not as successful as could have been desired.

In reporting on the crops of the past year, we believe there has been a fair average yield, except of wheat, which suffered to a great extent from the ravages of the midge. We believe ten bushels per acre may be set down as the average of this crop. Hay was an abundant crop, and we hear of large yields of clover seed coming in this winter. So far the winter has been favourable for stock, and with the large amount of fodder on hand it may be expected that butcher's meat will be plentiful during the coming spring.

The falling off in the wheat crop, for several years past, is a serious matter for the Canadian farmer. It is true the substitution of barley for wheat, which has found a ready market at remunerative prices, has in a great measure relieved the farmer from what might otherwise have been a great calamity. But it is uncertain how long these large crops of barley will continue with our present means of obtaining manure. It must be very apparent to those who are acquainted with the subject, that from the long course of cropping, to which the land has been subjected, it is becoming more or less exhausted. The great question is, where and what is the remedy? The great want of the land is manure; how is this to be obtained? The price of farm produce will not justify the farmer in expending large sums of money in commercial manures. These manures, in most cases

where they have been used, have proved very unsatisfactory. We venture to suggest that the Legislature should add another to their long list of inspectors, by appointing an inspector of artificial or manufactured manures, so that before these are sent out, they undergo a strict analysis, that the purchaser may know what he is buying, and for what crops, and also for what kind of soil it is adapted.

Another suggestion is plough less, grow more coarse grain and roots, keep more stock. By this system the stock of home-made manure will be greatly increased, and the fertility of the land restored.

The opening up of the market in Great Britain for Canadian cattle and sheep, seems to remove every difficulty on this head; as they are quite prepared to take all we can send them; all we have to do is to breed the right kind of stock. To do this it will be advisable to use the best male animals obtainable with our Canadian female stock. A very encouraging feature to stock raisers is the great advance that has taken place in dairy produce. Those engaged in this branch of husbandry may reasonably look forward to fair profits in the coming season. You will be gratified, and perhaps a little surprised, to be informed that Mr. Jas. Eakins has exported from Port Hope fifteen thousand sheep and two thousand head of cattle during the past year.

While on this subject, it will not be out of place to say a word on a matter which must have arrested your attention. We refer to the case of sheep *versus* dogs. In the Township of Hope, during the past year, the sum of $730 has been paid for sheep killed by dogs; this is only half their sworn value. Multiply this by two and you have the sum of $1,460; multiply this sum by the townships—in Ontario if you please—and you have an amount somewhat startling. We think you will conclude that unless something is done to abate this dog nuisance, sheep husbandry—the most important part of stock-farming in Canada—must be abandoned.

Of the exports of agricultural produce for the past year, we cannot make anything like a correct statement. From the Harbour Master's report we find that the shipment of barley amounted to 485,771 bushels. This with the home consumption would make at least half a million bushels brought to the Port Hope market.

Wheat	296,522 bushels.
Flour	2,393 barrels.

As there was a large amount of wheat and flour shipped per Grand Trunk Railway we have been unable to arrive at the correct figures.

Peas	38,533 bushels.
Rye	17,779 "

We also find by the same statement that Mr. Beamish has imported 800 tons of plaster-stone (gypsum), which has been ground at his mills in Port Hope, and sold for manure in this and neighbouring counties.

In committing the business of the Society to our successors for the coming year, we desire to express the hope that the large and varied interests of agriculture may be greatly promoted by your wise and prudent administration.

In all probability the exhibition of the Central Association No. 5, will be held in Port Hope in the fall of this year. To make it a success will require "a long pull, a strong pull, and a pull all together." We hope that all authorities and powers will combine to make it what it should be—a credit to Port Hope and the old County of Durham, the county in which one of the first, if not the first, agricultural society of this Province was established.

DURHAM, WEST.

Your Directors are happy to report that, notwithstanding the continued stringency of the times, this united Society still maintains its high state of efficiency.

Your Directors find, in comparing the returns of the past year with those of former years, that there is an advance in all of the following items: number of members, amount

of subscriptions, amount received for admission to show-grounds, amount paid in prizes, and in the amount of balance in hand.

Your Directors are also happy to know that all the Branch Societies in connection with this Electoral District Society are in a high state of efficiency.

Your Directors have been pleased to receive official information of the formation of a Horticultural Society, in the Village of Newcastle, under favourable auspices.

Your Directors recommend that the union of the two Societies, which has worked so successfully from the first, be continued for the ensuing year.

In reviewing the year now past, your Directors are reminded that death has entered the circle of your Directorship and suddenly removed a respected colleague, Mr. Wm. Clemens, who for many years had occupied a prominent official position in connection with this Society. Your Directors take this, the first opportunity, to tender their sympathy to the friends of the departed.

As the term of office of our esteemed friend and colleague, Samuel Wilmot, Esq., who has so efficiently represented the Division of which this Society forms a part, at the Council of the Agricultural and Arts Association, and who, for the past year—the most important probably in the history of the Provincial Association—has filled the high and honourable position of its President with such marked credit to himself and satisfaction to the entire Association, has expired, it will be necessary to take steps at this meeting to fill the vacancy. Your Directors would call attention to a change in the law with regard to the election of members of the Council, by which, instead of voting directly for the person to fill the position, each Electoral District Society is required to elect a delegate to represent it in a meeting of delegates from all such societies in the Division to elect a member to represent it in the Council of the Association. There can be no doubt that this Society will unnanimously renew its confidence in the gentleman whom it had the honour of being instrumental in first introducing to the Division and placing in a position which he has filled with such lustre to himself and his constituents.

Some little progress has been made during the year in the matter of obtaining a more commodious show-ground for this Society. The committee having that matter in charge will be able to show the present position of the negotiations in that regard.

Your Directors have the pleasure to submit herewith a statement of receipts and disbursements during the past year, with a classified statement of prizes paid, and a list of members of the Society, as required by the Statute, which they hope will be entirely satisfactory.

ESSEX, NORTH.

The annual Exhibition of the Society was held at Woodslee on the 8th and 9th days of October, and was again attended by unfavourable weather, which prevented it from being as successful as people would naturally have expected it to be had the weather been good. * * *

Although the aforesaid causes militated against the undertaking, both as regards the number of entries and the attendance of spectators, we are happy to say that the Fair was a success.

Your Directors feel pleased to report that the number of entries was greater in nearly every class, than at any former Fair of the Society, and the exhibits themselves of such a character as to elicit praise from nearly all the visitors.

It was utterly impossible under the circumstances for live stock to show to good advantage. However, there was a goodly number shown, and a marked improvement in every class was strikingly apparent, which goes to show the great advantage to be derived from the introduction of high-bred stock animals, and it is evident that our farmers have come to this conclusion by noticing the large and well-bred horses and cattle exhibited at the North Riding Fair.

There was one drawback to the holding of the Fair successfully, namely, the want of sheltered pens for the smaller animals, and good waterproof stalls for cattle and horses. Farmers and others having valuable stock do not wish to expose them to the broiling

sun, or heavy and perhaps cold rains, which are liable to prevail at the time of the year when our fairs are generally held.

There was an excellent show of horses of nearly every variety of the larger breeds, but the progeny of the Clydesdales predominated. Farmers have, as a general thing, come to the conclusion that it does not pay to raise pony horses, and have gone more extensively into the breeding of draught or general purpose horses, which always command a fair, if not a high price, and are good either on the farm or on the road. The number of entries in the horse classes was 102, and the amount paid in prizes, $118.

Horned cattle were entered in unusual force, and showed that a great change is being made, both by private enterprise and by the local societies in introducing thoroughbred stock animals.

The cattle exhibited were without exception either pure Durhams or grades of that blood with the common stock, and the young things exhibited gave proof of decided improvement over those shown at our former fairs. There is one thing more needed to make stock-raising a success in this Riding: that is the introduction of full-blooded Durham females. If this defect were corrected the improvement would go on much more rapidly than by the present system.

The number of entries in cattle was 75, and the amount paid in prizes $66.25.

The number of sheep entered was comparatively small, but the quality and general appearance of the specimens exhibited was excellent, and would reflect no discredit on a Riding of much greater pretensions. The number of entries in sheep was 57, and the amount paid in prizes $68.

The swine show was not very numerous, but in quality they indicated a marked improvement over former fairs. The Berkshire, Suffolk, and Essex breeds predominated. The entries in swine were 66, and the amount paid in prizes $52.

In poultry the display was small, but the quality of that shown was above the average generally seen at county shows. The entries in poultry were 59, and the amount paid in prizes $7.25

There was a great quantity of grain and seeds on exhibition, and in nearly every case the quality was extra good, while the quality of the fall wheat was above the average shown at county fairs the past season, and was pronounced by experts in wheat raising and dealing, to surpass in size and fulness of berry, that shown at the last Michigan State Fair. The barley and oats were also capital. The entries in seeds and grain were 135, and the amount paid in prizes $50.25.

The show of field roots was only passable, if we except potatoes, which for size of tuber were enormous, and there was a good quantity shown. The Early Rose variety predominated, but there was a good display of other varieties, such as Snow Flake, Peach Blow, Late Rose, California Whites, Brownell's Beauty, etc. The garden vegetables, field pumpkins, squashes, cabbages, cauliflowers, etc., were extra good. The number of entries in roots, vegetables, etc., was 98, and the amount paid in prizes $14.75.

In fruit there was a very large display, and all of superior quality. The entries in fruit were 66, and the amount paid in prizes $28.

The class of dairy products and provisions was not as well represented as might be expected, but the quality of that shown received well-merited praise, more especially the bread, butter, and cheese. Entries 50; paid in prizes $28.75.

The department of home manufactures of wool and leather, was not extensively represented, but what was shown in that class was well worthy the attention of visitors, and a credit to the manufacturers. The number of entries was 41, and the amount paid in prizes $25.

In the department of wood, iron, tin, etc., there was keen competition, and a large display of very superior articles.

The show of highly finished carriages, buggies, etc., was very extensive, and displayed alike excellent taste and skill on the part of the manufacturers. The number of entries made in home manufactures of wood, iron, tin, etc., was 125, and the amount paid in prizes $33.

Your Directors must here express their gratification at seeing the rapid strides the County of Essex is taking in the manufacture of superior farming implements, etc.

In ladies' work there was also keen competition, and much of what was shown evidenced great skill and patience on the part of the fair exhibitors. The entries in this class were 113, and the amount paid in prizes $43.50.

Rochester and Maidstone.

Your Directors regret that they have to report a falling off in the number of members for the past year. A list of the names of those who paid, and the amount paid by each, is hereto annexed. The North Riding Society's Fair was again held at Woodslee last October, therefore your Directors did not hold any fair in 1879, but used the funds at their disposal in fitting up the fair grounds and for the purchase of stock animals to replace those whose time of service had expired. The appropriations for the purchase of stock are made on the condition that the members in the Division requiring them shall subscribe at least $25 for the next three years to the funds of the Society. Only one Division complied with these conditions, and the members of that Division had to supplement the Society's appropriation by a considerable amount to enable them to purchase a suitable animal. The members in the Division on Middle Road, in the township of Rochester, failed to subscribe the amount required, and therefore the appropriation for that Division has not been expended. A great deal of loss is complained of in consequence, but your Directors consider the members of the Division have only themselves to blame in the matter.

During the past year the claim of the Society has run out on the Durham bulls kept by William McCloskey and Thomas Plant, and on the boars kept by Michael Fitzgerald, John Brookes and James Byrne.

The stock bought during the past year were a Durham bull, which cost $100, and $16 for expenses, towards which your Directors allowed $85; and a Berkshire boar, which cost $10; and a boar, which cost $18. The Auditor's report and the Treasurer's statement will show a detailed account of the receipts and disbursements for the year.

The Society at present have claims on the following stock: 1. A Durham bull kept by Miles Doran, term runs out October 16th, 1880; 2. A Durham bull kept by John Brookes, term runs out October 16th, 1881; 3. A Suffolk boar, term runs out December 12th, 1881; 4. A Berkshire boar kept John Brookes, term runs out October 29th, 1881.

With regard to the future management of the Society, your Directors would submit for your serious consideration whether it is desirable to continue the practice of using all the funds of the Society in purchasing stock animals or not. A higher and more expensive class of animals are now required than formerly, and the funds of the Society are not sufficient to pay for them, unless they are supplemented by the members of the Divisions.

At the present time there are bulls required in three Divisions, and boars in the same Divisions. Your Directors appropriated a sum not to exceed $80, expenses included, to purchase a bull for one Division, and sums not to exceed $18 each, expenses included, to said Divisions, to purchase boars with. The boars are kept for two years for the use of members, and are kept free of charge to the Society. The keeper of each bull receives $10 a year for keeping a bull for three seasons for the use of members of the Society, the animals reverting to the keeper in all cases at the end of the term.

Sandwich and Maidstone.

This Society continues the practice of purchasing superior male animals for the improvement of live stock, which animals are sold after members have availed themselves of their services.

This Society is in an efficient state, having a good balance in hand. If societies in general would adopt special means of improving farm animals by obtaining the best animals within their reach, and steadily pursue an intelligent course of selection and management, the results would be of incalculable advantage.

Tilbury, West.

The returns of this Society indicate a steady rate of progress during the past two or three years. A ploughing match was held in 1879; the number of competitors was smaller than might have been reasonably expected, but the number of spectators was great, indicating the interest that was felt in this very important department of practical agriculture. The total exhibits in 1879 amounted to 417, being 75 more than the preceding year.

ESSEX, SOUTH.

At the expiration of another term of office your Secretary would respectfully submit the following report of the transactions of the Society during the past year, and other matters connected with the agricultural interests of the South Riding.

The Annual Exhibition of the Society was held at Amherstburgh, on the 1st and 2nd days of October last. The weather was all that the most sanguine could wish. The attendance, both of exhibitors and non-exhibitors, was large, and the number of articles exhibited was greatly in excess of any shown at any previous show.

The total number of entries made exceeded twelve hundred, and were distributed in the various classes, as follows, viz.:—Horses, 129; cattle, 107; sheep, 63; swine, 37; poultry, 24; seeds and grain, 122; roots, 78; fruit, 207; dairy and provisions, 66; home manufactures, 215; and ladies' work, 168. The total number of exhibitors was 149, or an average of eight entries to each exhibitor; and out of 149 exhibiting, 124 took prizes—about three-fourths of the members of the Society, from the energetic individual who made sixty entries to the twenty individuals of lesser note who only had the honour of showing one article each—but sixteen out of the twenty had the satisfaction of winning prizes.

Evidence is not wanting to show that the interest taken by the farmers in our agricultural shows is constantly on the increase.

Comparing the years 1875 and 1879 together, we find that the entries have nearly doubled since 1875, and should they continue to increase at the same rate for the next five years (and we have every reason to suppose that they will), it will behove us to look out for more extensive and fitting accommodations.

Your Secretary would now call the attention of this meeting to a matter that, although more immediately under the control of the Directors, is one, from its nature which concerns each member of the Society as well, and this is: that as the entries increase in number, some mode must be adopted to make them with greater facility than the mode under which we work at present.

In a previous report your Secretary advocated either a three-days' fair, or as an alternative that the entries should *all* be made previous to the fair day. The experience of the last fair still confirms him in his opinion, then advanced, that some such plan must be adopted.

Although on that occasion we had a double staff of assistants, the work was so great that it taxed the energies of all concerned in order to get through at the hour fixed for closing.

Your Secretary then, after mature consideration, would prefer the plan of making entries, say, a week at least before the fair. The number of entries would then be known, and the committee of arrangements would then know what accommodations would be needed, and have all duly prepared in time, and not work in the dark as heretofore. Another advantage of this plan would be that the officers of the Society would be at liberty to attend to other duties on the fair-days equally necessary, and not leave those duties, as is often the case, to be performed by inexperienced and irresponsible persons.

In conclusion, while the farmers of Essex have great reason to rejoice over the abundant crops of all descriptions which have been gathered in during the past year, for the remunerative prices obtained for the same, and for the unmistakable signs of prosperity observable on all sides and among all classes, let us not forget to offer to the Bountiful

Giver of all Good our heartfelt thanks and praise for past favours and blessings, and our prayers that such favours may be continued to us in the future.

GREY, NORTH.

The Board of Directors for the year 1879, report as follows:

They have held eleven different meetings during the year, and have given a great deal of time and attention to the matters connected with the Society's operations. * *

A Seed Fair was held on the 4th of March, at which premiums were offered for five classes of wheat, one of barley, two of oats, two of peas, and one of timothy seed. The total number of entries made was twenty-four: 12 of wheat, 1 of barley, 7 of oats, and 4 of peas. The premiums offered were: for wheat, $15; for barley, $2.50; for oats, $5; for peas, $5; for timothy seed, $2.50. This Exhibition having been held by direction of the members at the last annual meeting, the result is now submitted for their information, and with the view of learning whether the interest of the Society is considered to have been so far promoted as to justify a like expenditure for a similar purpose in the year 1880.

The annual Spring Show was held on the 26th of April. Four heavy draught and three general purpose stallions, and five Durham bulls over two years, and three under two years, were entered for exhibition. The premiums offered were $10 in each of three classes of horses, and a like amount in each of two classes of bulls. In the thoroughbred class of stallions no entry was made. It cannot be said that there was any improvement on former shows.

The Agricultural Society of the township of Sydenham and the Horticultural Society of the town of Owen Sound having again agreed with the North Riding Society to hold a Central Show on the 24th and 25th of September, a special committee of five from each of the three Societies was appointed for the making of all the necessary arrangements, as well as for the preparation of a prize list. The total number of entries made for this show was 1,765, being 250 less than that of 1878. In the departments of Fruits and Flowers, the show was, as in the previous year, a decided success, although the fruit entries fell short of those in 1878 by 89. In ladies' work there was a falling off of 76 in the number of entries, but the quality of the work was regarded as being fully up to that of the previous year. The total number of entries in manufactures was 39, 7 less than in 1878. Local manufacturers appear to take very little interest in the show, which is a somewhat singular circumstance in view of the advantages likely to result from the exhibition of their products before a large assemblage of people. In the class of roots and hoed crops there was a falling off of 64 in the number of entries, and the articles shown did not reach the excellence of those of many previous years in many particulars. The entries of vegetables exceeded those of 1878 by 38, and in most cases were up to the average standard; the cabbages, however, showing marked deterioration.

In grain and seeds the entries fell short of those of the preceding year by eight, but the general quality of the varieties exhibited was fully an average. In this class it was found necessary to procure a hopper, into which to discharge the bags, and in one instance in which the grain at the top of the bag was of first-class quality, and would have taken a prize, the bottom was found to be a very inferior article indeed. The winter wheat crop was exceptionally good last year, while spring wheat was not more than average. The oat crop was good and abundant in the yield, and peas were also a fair average crop.

In swine the entries were nine less than they were in 1878, and the quality was about that of ordinary exhibitions of this Society.

In sheep the entries exceeded these of 1878 by eleven, and the exhibition was a specially good one.

In cattle there was an increase of twenty-one in the number of entries, which may probably be accounted for by their being required to be on the show ground one day only. For years there has been a steady increase of the quality of cattle raised in this section of the county, and the general result was perhaps made more clearly apparent at the last Christmas Show of Fat Cattle than it ever was before.

In horses there was a falling off in the number of entries to the extent of forty, or over 30 per cent., a fact which may fairly suggest the inquiry whether the Spring Shows of stallions are answering the purpose which they were designed to promote. In the heavy draught class of young animals, seven entries only were made, three being two-year-old geldings; two, two-year-old fillies; one, a colt foal; and one, a filly foal. What is the conclusion to be drawn from this statement? Is it that the heavy draught class of horses is not regarded as being suitable for the uses of agriculturists in this part of the county? Or is it that young animals which should be shown in this class are entered in the general purpose class because from their superior size and appearance they will be more likely to snatch a prize in that class? Or is it that although the sires may have the appearance of properly belonging to the heavy draught class, their origin was not such as to ensure that their progeny would not retrograde to something of an inferior kind? Or is it that the mares of this section are unsuitable for producing foals that will maintain the heavy draught character? The subject is one which is of sufficient importance to warrant its being prominently put forward, for when the day comes that the surplus of horse production will demand an outside or a foreign market it will almost certainly be found that what is called the "general purpose" class of horses is that which will be least in request, and, consequently, least remunerative.

The heavy draught horse, on the one hand, and a good class of nearly thoroughbred animals, possessing plenty of bone and muscle, on the other, will turn out to be those which will create the greatest inquiry, and bring the best and most remunerative prices; and as it will require time and care to enable the supply of an active demand, it will be a point of prudence on the part of agriculturists to consider the question fully, and to take such measures, promptly, as they may judge to be most advantageous to them in the future.

The Christmas Show of Fat Animals was the best ever held by the Society, the total number of entries being ninety-eight, as against forty-nine for 1878. Such a record may induce the hope that farmers are turning their attention much more largely to the growing of root crops and the feeding of cattle than was their wont, and that less reliance has begun to be placed on the wheat crop than there formerly was. A certain market for good meat at remunerative prices has now been opened with the land on the other side of the Atlantic, and the ability of Canadians to supply the demand caused thereby will be taxed to its utmost stretch. The absence of epidemic diseases among Canadian cattle has, during the past year, left this market largely in their hands, and present indications are that it will remain so for some time to come. The opportunity thus offered to the farming community is by no means a speculative one, for whatever the effect may be upon the home consumer, the producer is sure of the increased price occasioned by the foreign demand.

The Financial Statement of the Treasurer is hereto annexed. It is a matter of regret to the Directors that they cannot resign their functions into the hands of their successors with a more satisfactory balance sheet than they have to present; and had not the gate money been exceptionally large in amount, the outlook would have been still less pleasing. The deficiency in receipts is to be accounted for, to the extent of $120, by the new basis on which the County grant was distributed this year, each of the Township Societies in the Riding having shared in the apportionment thereof in the proportion in which the Legislative grant was allotted. As was remarked by the Directors of 1878 in their report for that year, it is only through co operative effort that the results for which societies, such as yours are founded, can be reached, and that the full advantages to be derived therefrom can be gained. The Directors therefore claim that they have a just right to complain that the farming community do not give to the Society that aid and countenance to which it is entitled. Were the matter looked upon and dealt with by the agricultural public as one affecting their material interests and calculated to be productive of great benefit to them, as it undoubtedly is, the spirit of apathy, if not of aversion, which now predominates, would yield to a disposition to join in the endeavours which the few are making to promote improvement and to point the way to more successful achievement.

If the lessons of the prize list were read aright, the spirit of envy, and jealousy, and uncharitableness, which has but too much prevailed, would give place to one of generous

rivalry and of resolute competition, because, let what may be said to the contrary, the maxim, "*Palmam qui meruit ferat*," is that which has governed and still governs the awards of the Judges, and meets the approval of the Directors.

It may perhaps be thought that this report should make some reference to the effect which the Union Shows that have been held for the last two years have had upon the Electoral District Society, and therefore the retiring Directors feel bound to state that in their opinion, their operation has been so beneficial and their advantages so apparent that it would be unfortunate should they be discontinued.

GREY, EAST.

In conformity with Act of Parliament your Directors beg leave to submit to the members of the Society their Annual Report.

Two Fairs have been held during the year—the Spring Fair and the regular Fall Exhibition. The Spring Show was not all that could be desired, as there were not many thoroughbred bulls on exhibition, but the show of horses was up to the average.

The Township of Artemesia Agricultural Society united with us previous to the holding of the Fall Exhibition, which was held on the 2nd and 3rd days of October. The weather was favourable, and the attendance of members and visitors was numerous; good order was maintained through the day. The entries far exceeded those of the previous year, and in looking over the books of the Society we are pleased to find that the Society is steadily improving financially and otherwise, every year exceeding the previous one since its origin.

The show of grain, roots and fruit in quality we believe could not be excelled in the Province. The exhibits of dairy produce were large and excellent in quality, and the ladies' work was extensive, and reflected great credit on the exhibitors. There was a fair show of horses, sheep, swine, and poultry. As for cattle we could not say much, as there were not many thoroughbreds on exhibition. This we feel is a great cause of regret and should be remedied if possible.

We are highly pleased to note the improvement in grain, both in quality and quantity, which is owing to the introduction of new varieties of seed; the Clawson fall wheat being the first in the fall variety, while the Russian and Lost Nation is fast taking the place of all other varieties of spring wheat.

Now, as Agricultural Societies generally have had a great deal to do with introducing new varieties of seed grain and thoroughbred stock, and the encouragement of improvements on agricultural implements, and have for their object the promoting of the interests of the agricultural community generally, we therefore are of opinion that it would be well if the Government would so supplement the annual grant as not to have Agricultural Societies depending on the various municipalities for aid, as many of their representatives are not farmers, and know but little of the good accruing from the thorough working of Agricultural Societies, and the keeping up of a friendly rivalry amongst the agriculturists of the Province; and indeed we find that Agricultural Societies have a great deal to contend with in carrying out the object they should have in view, which is the advancement of the agricultural interests of the country.

Notwithstanding the many hardships, trials and disappointments incident to the lives of farmers, their prosperity is evidently seen in some parts of our agricultural district, by the erection of good comfortable dwellings, commodious barns and outbuildings, and numerous other substantial improvements.

In East Grey many of the most prominent farmers commenced life with but little more than their axes in their hands, and have succeeded in hewing out a home for themselves and families; and after years of trials of various kinds, find themselves entering upon one of comparative comfort and enjoyment.

Farmers occupy a proud position among the men of the earth. At a very early

date of the world's history, man was appointed to till the ground and raise stock, and the nations of the earth that have been most prosperous are those that have done most to develop their agricultural resources. It is to the farmer that the vast population of the earth owe their bread. Take away the fruit of the exertions of the cultivator of the soil and there would be nothing more for ships, railroads or telegraph wires to do—in fact, all the mighty enterprises of man must fall through. Therefore it becomes every man, no matter to what trade or profession he belongs, to come right to the front, and pray, "God speed the plough."

HALDIMAND.

The Directors, in presenting a brief report of their proceedings during the past year, have much pleasure in congratulating the Society on its improved financial position, being now entirely free from debt, and a respectable cash balance in hand.

The number of entries and the receipts from visitors at the exhibition were larger than those of the previous year. That was, no doubt, in a large measure owing to the favourable weather on the day on which the exhibition was held.

The display of horses was creditable to our county. The horned cattle show was equal to former years. In sheep and swine the numbers were in excess of former years. A few pens of Merinos were on exhibit, being superior animals—a class of sheep coming into favour, owing to the high quality of their mutton, and taking on flesh rapidly.

Grain, seeds, roots and vegetables, were in excess in quantity of the previous year. Considering the unusually dry summer the quality was excellent.

The display made by the ladies was never more conspicuous than that on this occasion.

In conclusion, your Directors have much pleasure in saying that the Society is steadily advancing in prosperity, and trust that under the management of their successors it will continue to prosper during the coming year.

HASTINGS, NORTH.

The President and Directors of the North Hastings Agricultural Society beg to submit the following report:

The annual Show was held on the 9th of October. Although the entries were 300 less than in 1878, the show the present year, in point of quality, was quite equal to its predecessors.

There were seventeen entries in the Blood cattle class with pedigree, all of which were exhibited. In horses, several of the heavy draught class were shown. The exhibition of sheep was fully equal, if not superior, to that of former years, and the same may be said of swine, farm implements, dairy produce, etc. In grains the judges had great difficulty in deciding, especially in white wheat. It is a sufficient guarantee to the excellence and superiority of the carriages exhibited to say that the Messrs. Bristol & Bro., of Madoc, are members of our Society, and exhibited work which carried off first prizes at Ottawa, Kingston, and wherever shown.

Your Directors also report that, being represented as we are by the Minister of Customs for the Dominion, being in possession of railway communication, and owning mountains of iron ore, and gold mines of the richest deposits and best quality, together with our immense pinery, should contribute to make this the most prosperous county in Ontario; but owing to the want of proper buildings and grounds, to the extreme length of the district (it being 150 miles by 29 broad), a great part of which is not arable land, and to the fact that the Show is held on the southern boundary, the Society does not meet with the support it would were the district more compact.

HASTINGS, EAST.

Hungerford.

The Show was held in the village of Thomasburg, on Friday, the 17th day of October last. The day being fine, there was a large attendance, and the show was a complete success, every class being well represented. The show of horses, cattle, sheep, and swine would compare favourably with many larger shows, there being a large number of entries in each class. The show of grain and seeds was very large and of the best quality. There was a good display of farming implements, carriages, waggons, etc. The exhibit of fruit, roots and vegetables was excellent, and was allowed by visitors to be the best they had seen at any shows in the county; the ladies' department being well filled with all kinds of fancy work, pictures, etc. On the whole this show was a complete success. The interest manifested by the managers will tend to make their shows in future compare favourably with any in the county.

HURON, SOUTH.

The Directors in laying their annual report before the members of this Society, have great pleasure in announcing that the Exhibitions held by the Society during the past year have on the whole been very successful, and the finances, as will be seen from the detailed statement of the Treasurer, are on a sound footing, a balance of $124.91 being to the credit of the Society on the year's operations. The amount paid out for prizes has been, at Spring Fair, $151; at Fall Show, $889. The membership has advanced to 106. The branch societies also show a satisfactory increase. The annual report a year ago deplored a great stagnation of business and deep distress existing throughout the country. It is a pleasing task to have to note the great improvement in trade, and the satisfactory condition of the agricultural and other interests at the present time.

The disastrous failure of the spring wheat crop of 1878, led the farmers of Huron to plant an immense amount of land in fall wheat, and the wisdom of this course is proved by the reaping of one of the finest crops of fall wheat ever grown in this county, whilst the history of the spring wheat crop of 1879 is a repetition of that of 1878. The midge and joint-worm have done their work with deadly effect, and an average of about six bushels to the acre is the scant reward of the husbandman. The pea crop is still infested with the bug, and as the only remedy is to discontinue the cultivation for a season, it is to be hoped that farmers generally will adopt this plan. Barley has been rather above an average, and the quality good. Oats—never was a better crop grown in this county, quantity and quality considered. Hay has been a fair average, and pasturage, especially during the autumn months, splendid. Potatoes are a fine crop, and the quality most excellent. Turnips, mangolds, and carrots have been a very uneven crop this season, some fields being exceedingly fine, whilst others were almost destroyed by the fly. On the whole, however, roots have been a fair crop. Fruit trees have yielded well, apples particularly so, and as our old acquaintances the codling moth and grub have departed (it is sincerely hoped never to return), an era of prosperity seems to lie before the fruit grower. As the quantity of fruit now grown far exceeds the consumptive demand of the country, the energies of fruit growers should be directed to the opening up of markets in Great Britain, Manitoba, and elsewhere. Upwards of 10,000 barrels of apples were this year shipped to England from one or two points on the Grand Trunk. The violent fluctuations which mark the produce trade, are well exemplified in the cheese and butter markets of 1879. During the summer prices fell to such an extent that many factories almost suspended operations, and consternation and dismay sat on the visage of the dairyman. The general idea seemed to be that the sooner the business was abandoned the better for all parties concerned; but hope revived when buyers bought up the fall make at exceptionally good prices. It is to be hoped that this valuable branch of farming will go on and prosper in the future. Perhaps, however, the development of

the cattle export trade to England will be the chief cause in preventing any further great expansion of the business, and it is interesting to mark how quickly new channels of trade are formed in place of those that have become choked or unprofitable. It seems but as yesterday that we heard of cattle being sent to England, and now the trade has assumed gigantic proportions. If the farmers of Huron wish to share in the profits, they must be up and stirring. Improved stock must be bred or introduced into this country, and the system must be so regulated that the cattle will be fat and in shipping condition in the month of April and through the summer, for it seems the general belief amongst cattle men that the winter shipment of cattle to England will not, till changes are made, be profitable either to the farmer or exporter.

In the stock department, we may remark that our breed of horses seems to be improving from year to year, attributable, no doubt, in a great measure to the enterprize displayed in importing first-class stallions from Britain. Whilst Huron is confessedly ahead in horseflesh, we must admit she lags behind in the race as regards cattle. It is pleasing, however, to note the establishment of several herds of Shorthorn cattle in this county during the last year or two, and to influences such as these must we look for the regeneration of our breed of cattle. As regards sheep and pigs, stockmen seem to about hold their own, and when we say this in regard to this stock we say a great deal.

In closing this report we trust that the year now opening upon us may be marked by a bounteous yield, and that an all-wise Providence may direct all things for our good.

HURON, WEST.

Goderich Horticultural Society.

Many gloomy predictions were made upon the opening of spring as to the probabilities of the fruit crop, but summer and fall told a cheerful story, and the result is that we can now report the crop of the past season in Huron one of the largest and best we ever had, especially in apples, pears, peaches and cherries; and while the quantity in grapes and plums cannot be placed quite as high as in some former years, the quality taken as a whole may be quoted as fully equal to any year. In all varieties of small fruits the past season's crop was the largest and best yet gathered in this county.

The County of Huron contains sixteen townships, four towns and five villages, containing in all an area of 800,000 acres. About 500,000 acres of this is under cultivation, of which 1¼ per cent., or 6,250 acres is in fruit orchards and gardens, one-fifth of which is in full bearing and gave the past season an average of two barrels of apples per tree. The balance of the 6,250 acres is in younger orchards and gardens, which will mostly be in full bearing in two to four years.

There are about 1,000 full bearing pear trees in the county, which the past season gave a crop of 2,460 bushels. Pear culture is rapidly gaining ground, so that in two or three years, with ordinary conditions, the crop will be more than doubled.

Peach growing is also in its infancy, so to speak, especially in leading varieties. Seedlings have been grown liberally for a number of years, but our best growers are now cultivating more largely of the leading varieties. Hitherto we have not had sufficient to satisfy the demands of the home market, but, unless the yellows appear, in two years we will have a large quantity for export. While peach orchards in many other sections of the Province are being devastated with that terrible disease, the yellows, we have not had as yet a single instance of the disease. But we fear another year will not pass so well, as growers are purchasing trees freely from sections where the disease is known to exist. We would advise growers not to purchase from the Niagara district or from any American firm, as such a course is almost certain to bring the yellows into our section. The only safety we can have now is to propagate from the home stock.—Peaches can be successfully grown along the lake shore and for a distance of about four to six miles inland.

That little pest, the curculio, has evidently discouraged many of our plum growers,

who have ceased to fight it. Notwithstanding this fact, the yield of the past season's crop makes a total of 2,314 bushels, with quality fully equal to any previous year, where care is given to cultivation.

For the guidance of growers we have carefully prepared the following list of varieties which can be grown successfully, and which our experience warrants us in recommending for home use and commercial value:—

Apples—Nearly every variety known in Western Ontario is grown within the county. Out of so large a list we select for summer, Red Astrachan, Primate, Williams' Favourite and Chenango Strawberry. For fall, St. Lawrence, Belmont, Fall Pippin and Fameuse. For winter, Northern Spy, Rhode Island Greening, King of Tompkins County, Baldwin, Ribston Pippin, Roxbury Russett, American Golden Russett, Hubbardson's Nonsuch, Swayzie Pomme Grise, Æsopus Spitzenberg, Wagener and Rambo.

Pears—Out of about twenty-five varieties grown we select Bartlett and Clapp's Favourite for summer, and Flemish Beauty, Beurre Clairgeau, Beurre Diel, Beurre Bosc, Beurre Hardy, Beurre Superfin, Louise Bonne de Jersey, Seckel, Steven's Genesee, Onondago, Belle Lucrative, Vicar of Winkfield, Lawrence, Beurre d'Anjou and Winter Nellis for fall and winter.

Plums—The opinions of growers vary so much that we merely give a list of varieties more generally grown through the country:—Lombard, Pond's Seedling, Bradshaw, Duane's Purple, General Hand, Huling's Superb, McLaughlin, Smith's Orleans, Prince Englebert, Reine Claude de Bavay, Victoria, Washington, Columbia and all the Gages. Mr. E. Bingham has a seedling of his own which we would place at the head of the list for excellence. It is being introduced, and will soon be before the public.

Cherries—Black Tartarian, Elton, Elkhorn, Governor Wood, Reine Hortense, Early Richmond, May Duke, Black Eagle, Napoleon, Bigarreau. The common small red cherry is largely grown for preserving.

Strawberries—We are glad to note that the cultivation of this delicious and useful berry is on the increase, and when we consider the fact of its coming in at a season when nothing else is to be had, and its great value in a family, our only wonder is that a garden plot can be found without a bed of strawberries, especially when from 50 to 200 plants would give abundance of fruit for any family. Many varieties are grown, chiefly Wilson's Albany, Jucunda, and Triomphe de Gand.

Currants—Red, white, and black, are grown in abundance. A few years ago black was little grown, but now it is in keen demand, and the most profitable of any for market value. The currant worm, which strips the leaves of the red and white varieties, has been very numerous the past season, but where taken in time with hellebore did but little damage.

Gooseberries—Of many varieties, home and foreign, have been tested with varied success. The objection to most foreign varieties is that they mildew badly. Houghton's and Downing's seedlings bear well and are free from mildew. Smith's white and Smith's improved bear well and are free from mildew, but are not considered so valuable for preserving as the two former varieties.

Grapes—Of all the early varieties can be grown successfully here, indeed no better section can be found in the Province for the cultivation of grapes of leading market varieties and those suitable for wine manufacture. We are sorry to observe that either laziness has taken hold of a large number of grape growers in the county, or they are ignorant of the proper methods of cultivation. It is a common thing to see vines running over fences, up trees and over sheds, in wild disorder, without the slightest evidences of cultivation or pruning. Among some of our successful growers two methods of pruning are followed. The first is known as the *alternate* method, or the growing of canes which the following year will bear the fruit crop; the other method may be termed *renewal*, or the growing of one or two main or lateral canes from which canes are trained or tied up on wires or slats: these are cut back every fall to one or two buds which are to form the next year's canes. We find advocates of both systems, the former of which is more minutely described by one of these growers, thus: Plant the vines about eight feet apart; in the fall cut off the first season's growth to two pieces of cane with two eyes in each. The second year allow two canes to grow, and tie to a six-foot stake driven firmly into the ground;

pinch off all laterals or branches as they appear, and also the top of the cane when about a foot beyond the top of the stake. In the fall cut back the weakest cane to two buds and draw up the stake to lay the remaining cane, still tied to it, upon the ground for winter. The following spring, drive in the stake and tie the cane to it about eighteen inches high, allowing the balance of the cane to hang over until the buds have well started, when the cane should be fastened up another eighteen inches, and in a few days the cane should be fastened at the top of the stake. Allow only one cluster of fruit to grow on each branch, pinching off these branches at four leaves from the cluster, and keep back the cane from making wood, as this growth would rob the fruit of the necessary sap required to produce and mature perfect fruit. At the same time that this cane is bearing fruit another cane should be growing upon a second stake which is to be the fruit-bearing cane for the following season. Each fall the *bearing cane* of the past season should be cut away and a new one grown. Our informant claims that this system can be followed year after year with success. Our local grape grower, Mr. J. S. McDougall, believes in spring pruning in certain cases, indeed he claims that it will not injure the vines in any case to bleed freely. He had one vine that gave no satisfaction as a producer of fruit, and spring pruning brought it into heavy bearing, he contends.

English Apples—Mr. Latouzel, of Cherrydale farm, Colborne township, is growing a number of English varities of apples by way of experiment. "Lord Sutlield" is a very fine conical shaped fruit, of a pale yellowish colour, with sometimes a slight blush on the sunny side. The flavour is a pleasant acid, juicy and crisp, and it is a good cooker. The tree is a strong grower and heavy bearer. Fruit ripens about the middle of September. The "Taylor Fish" is a large, green apple, ripening about the end of September, shape similar to fall pippin. It is too acid to make a popular eater, but cooks well. The tree is a strong, heavy bearer, and the fruit remarkable for evenness in size.

The Fall Exhibition.

The Directors have much pleasure in congratulating the members upon the continued prosperity of our Society. The members' subscriptions amounted this year to $315.56; the town and Legislative grants amounted to $307.29, making a total of $622.85, which was handed over to the Treasurer of the West Riding Agricultural Society upon the terms of our amalgamation with that Society. The prize-list was increased and arranged in a manner calculated to call forth keen competition. Our object was fully and satisfactorily accomplished, as the large and wide-spread list of prize takers abundantly proves. In apples the show was very large in all sections, and the quality very fine. There was no appearance of spotting, and a delightful absence of all traces of the codling moth. The selection of varieties to make up collections was much better than heretofore, showing clearly that our growers are becoming better acquainted with selection of fruits for dessert, cooking, etc. Among the finest grown varieties were Northern Spy, Rhode Island Greening, Fameuse, Baldwin, St. Lawrence, Duchess of Oldenburg, Gravenstein, Æsopus, Spitzenberg, King of Tompkins County, Roxbury Russett, Swayzie Pomme Grise, Ribston Pippin, 20-oz. Pippin, Hubbardson's Nonsuch, Hawthornden, American Golden Russett, Beauty of Kent, Porter, Swaar, Rambo, Wagener, Yellow Belleflower, Red Astrachan, Primate, Early Harvest, Pearmain, Bourassa, and many others. The show of pears was the largest yet held by this Society, and quality has never been excelled in Huron. Everybody seems to grow the Bartlett, and one grower said if he were asked for the best selection of pears he would advise Bartlett, and stop there! His ideas are not carried out, however, and hence we find about twenty good varieties freely grown. The show of plums was smaller than on some previous years, the cause of this being doubtless the fact that growers have ceased, as a rule, to fight the curculio. This is cowardice unworthy of a fruit grower, and we trust the cudgels will be taken up next year with renewed vigour. There is no better section of Canada for plum growing than ours, as the many large crops of previous years prove. We look upon it as the duty of every grower to fight the curculio constantly, trusting to the future to develop some enemy which may relieve us of the pest summarily, or that it may leave this section without giving notice or reason, just as other

pests have gone before. Peaches made a fine show, but as yet the competition is confined to a few. The climate and soil of the lake shore district is so admirably adapted to the culture of this magnificent fruit that we only wonder large fields had not been planted out years ago. Now, however, local growers are planting freely, and with ordinary good luck large crops can fairly be looked for. The varieties successfully grown at present comprise Early Crawford, Large Early York, Barnard, Foster, Early Beatrice, Alexander, and Late Crawford. In grapes we always excel, and this year was no exception. The competition as yet is confined to a few for under-glass varieties, but in open air varieties the competition was very keen and wide-spread. All the leading open air varieties are grown successfully. Mr. J. H. Williams continues to grow his seedlings—Nos. 1, 2, and 3—with promise of success. Garden vegetables were unusually fine and the display large. Our judges have done good work in making a careful selection of the finest grown table vegetables. We have seen the time that judges would often select the largest beet for the first prize, not so now—clear growth and make and fine quality are made the standard of excellence. So with all other vegetables, the decisions of the judges display more skill. Mr. A. McD. Allan has grown sweet potatoes for the past two years successfully in the open air, some of his specimens turning the scale at six pounds. He lays down the tuber in a hot bed, and when shoots of three inches spring up these are broken off close to the tuber and planted out in hills or in drills. They should be planted out as early as possible, as the sweet potato requires a long season to reach maturity. They require a rich well-cultivated soil. The varieties grown were Early Peabody, Early Bermuda, and Yellow Nansemond, the latter being the best.

Among the many varieties of potatoes grown the Early Rose still holds first place. Late Rose and Early Vermont are well reported from some sections. Brownell's Superior will never become a favourite, as it ripens late and is inclined to be watery. Mahopac Seedling is poor and will soon run out altogether. Snowflake has not proved a large cropper, but quality for table is good. Beauty of Hebron gives promise of high value for general cultivation, and after another season's test we will be in a position to speak more positively regarding it.

Plants and Flowers—Although there is not a money recompence in the cultivation of flowers, yet there can be no doubt but it brings a great deal of pleasure and recreation to the minds of cultivators as well as others who come in contact with the refining influences. Hence it is indulged in by man wherever you find him in an advanced state of society, and here we think, if such is a criterion of cultivation, we might lay some claim to the title. We have every reason to believe that, with the exception of some of our cities, there is no locality in which the flower-garden occupies a more conspicuous part than in this town and immediate vicinity. Even in the cultivation of window plants—to see a house without them is the exception and not the rule. At one time we laboured under disadvantages, there was not a local supply, we had to purchase in the cities. This is now obviated, as the local florists can far more than supply the demands, in fact could accommodate the whole county, and also keep up to the improvements that are constantly taking place, especially in bedding-out plants, which almost every one here goes more or less into. But we are sorry to see they often neglect to cultivate good substantial herbacious perennials. There is one class of plants that has not been a success here, but we believe this locality is not an exception in this respect, and it is therefore all the more to be regretted, as a more beautiful or finer, we think, is not grown: we have reference to the Japan Lily in all its varieties. But there is one lily grown largely here that may be said to be the *summum bonum* of lilies, and that is Candidum; could we only have other colours of it then nothing would be wanting in that respect. The gladioli, in all its gorgeousness, is grown by almost every one here, and every year is adding more and still finer specimens. Of late, roses, especially of the hybrid perpetual class, have been more generally cultivated. We find that insect pests that they are subject to can be easily mastered with vigilance and care, so that all the newer kinds are being introduced as well as old standard varieties, and they certainly are giving great satisfaction, some of them completely astonishing the beholders for their size, grace and beauty. But there is, perhaps, no plant (for we can scarcely say flower) that is taking such hold of the public fancy as the foliage varieties, more especially Coleus; the beauty and variety of leaf-colouring is equal, if not superior, to the beauty

of the blossoms of almost any other plant. We think this plant is deservedly worthy of cultivation, as it gives satisfaction every way, appearing fine the whole season until killed with the autumn frosts, which is more than can be said for many more flowering plants, excepting the geranium, which, as a bedding-out flowering plant, is excelled by nothing that has yet been tried in this locality that we are aware of. Of flowering shrubs, perhaps everything is grown here that can be grown in the Province of Ontario, and as far as hardiness is concerned there is no trouble, the only drawback being—in many varieties—their short duration of bloom. Climbing plants are being introduced here, such as the newer varieties of Clematis; but we cannot speak decisively of this class, as there has not been experience sufficient to warrant us in arriving at a satisfactory conclusion. There is one class of climbing plants that is likely to give satisfaction, and that is the Japanese honeysuckle, such as Halliana, Brachypoda and Brachypoda Aurea Reticulata; their hardiness is beyond question, and their fragrance adds much to their other qualities. There are also some features of climate, more especially along the lake shore, that gives certain plants here a value that other localities cannot claim, and that is the absence of frosts in the fall, in the early part of October. Almost every fall, throughout the greater part of Ontario, we find all tender vegetation cut off, while here they are not affected. This gives us a chance of having some varieties of flowers in all their beauty and perfection, which are almost invariably cut off in many other sections. Especially is this the case with the dahlia, which often makes little growth until the late rains and cool weather of autumn, it is then they luxuriate and find the season for which they seem to have been waiting. They appear to revel in the cool moist weather of approaching fall, and are soon loaded with their many-coloured spheres of wonderful construction, which certainly gives them a charm when many other flowers are gone or failing. The petunias also continue to flower in all their gay splendour, which, in many other sections, so late in the season, would be only bare stems. Our spring also seems suited for the production of some lovely things, offering themselves, as it were, for our pleasure and refinement, would we only do a little towards protecting them in the late fall; we refer to the tulip and hyacinth. Of the former we need not say anything, so well is it known and so widely grown and appreciated that nothing we could add would enhance its value. The hyacinth is undeservedly neglected. For value, as an early spring flower, it has no successful competitor, and by following a few simple rules it can be grown in perfection and will be sure to pay for all the trouble expended. In the parlours its fragrance cannot but be appreciated. There is one charming bedding plant we think well to refer to—as many fail in cultivating it to perfection, for which there is not the slightest occasion—we refer to the verbena. After its culture two or three years in the same soil no amount of manuring will enable it to do well, as it exhausts certain substances contained in the soil, and the only way to get over the difficulty is to either change the bed or else renew the same. Sods thrown in a heap in the fall and allowed to rot make an excellent soil for the verbena. Remove the old soil and in the spring replace with the prepared rotted sods. This is the only remedy that can be of service. Our last fall show was conclusive proof—if any such were wanting—that there is a real live interest taken in floriculture here. The exhibition in this department is always very fine, and competition was keener than usual, proving that there is no falling off, but on the contrary, a good healthy and earnest desire to do the best that can be accomplished, and at the same time not to allow any hard feelings to intrude themselves in connection with our exhibitions.

New and Seedling Fruits.—From our experience we feel safe in stating that this class should be watched over with the utmost care and by experienced judges. Among the many new seedlings we find a very small percentage of even fair fruit. Many unprincipled nurserymen and all tree brokers are continually introducing some new varieties for the purpose of making money out of a high sounding name or a "long pedigree." In apples it is rarely we find a medium in quality among new seedlings. The past season agents were through this county selling the Pocklington grape vine at $2 each. We know this grape, but do not know that these agents are selling the genuine vine. However even if they are we believe people are throwing money away by purchasing it, as we do not believe it will ever be a profitable fruit. Indeed some leading grape growers on the other side of the lines have grave doubts as to its right to be classed among fruits at

all. It is said that an investigating committee in N. Y. State reported it valuable for its *hard* quality, and they recommended their Government to purchase it in quantities to send to the far West to shoot Indians with! We have too many varieties of the various kinds of fruits in cultivation already. . We do not wish to discourage those who are experimenting, for this is good in its place, and occasionally valuable varieties are produced, but we object to every sort of trash being foisted upon the public as at present.

Tree Brokers—This is originally an American "institution," but we have imported the pest, and find ourselves in possession of an evil equal in destructiveness to the curculio, if not surpassing this much feared insect. Pity these creatures are not liable to an attack of the yellows! We have often warned fruit growers in Huron to beware of all agents representing foreign firms and especially these "dealers." Indeed the only safety is in dealing only with some well-known home firm.

Diseases, etc., and Remedies—*Grape rot* made its first appearance this year in a few gardens, affecting Rogers No. 1, Eumelan and Concord more than any other varieties. One grower reports that vines grown with a southern exposure are affected worse than in any other, while an easterly exposure is generally free. The disease begins with a small white speck which in a few days turns black and rapidly spreads over the berry, and finally over the bunch. Those who have tried sulphur say it does not remedy the evil. Until further light is obtained we would advise growers to watch the fruit carefully and remove all affected berries as soon as observed, also drain the soil planted out in grapes well.

Pear Blight has been written upon in every shape, form and fashion by scientific and practical men versed in horticulture, and yet we have blight every year in many orchards. If it be true that the disease is caused by a minute fungus which penetrates through the bark destroying the cell structures, then we would fancy the evil could be remedied by a proper wash. We have had linseed oil tried as a wash in spring with several growers and thus far have not heard of a case of blight among trees so washed. Mr. F. Seegmiller, who tried it on a number of trees reports them not only free from blight but much cleaner and healthier in appearance than the other trees. Among his trees not washed he had a number of cases of blight which fairly beheaded the trees. It takes a very small quantity of oil to wash a tree, a cloth saturated in the oil is the easiest way to apply it, after which the tree should be scrubbed with a coarse brush. As the remedy is cheap and simple we hope all pear growers will give it a fair test and let us have the results next fall. The only care necessary is not to use too much oil.

Black Knot is still to be seen notwithstanding the Legislative Act, and we don't think it will disappear should a copy of said Act be posted up on every plum and cherry tree in the country. The only remedy is to cut out the knot before it breaks, say about the middle of June. When the knot breaks the spores are easily distributed from tree to tree and orchard to orchard. If every grower looks carefully to this we can be free of black knot in a couple of years.

Codling Moth—An old fruit grower says that he has kept his orchard free from this enemy by lighting small fires at night through the orchard before the blossoms open. He would continue this for about ten nights. The moths, he says, will rush in hundreds to the fire and forever leave us. The remedy is certainly simple and well worth trying.

Curculio—Perhaps we had better say nothing, so many remedies have been advised and so far all proved of no avail excepting the jarring of trees. However, we may mention the recommendation of a fruit grower and let those who wish try the remedy. The smell of coal oil will, so our informant says, keep the little pest away. The oil should be put in bottles one or two of which to be hung up in each tree and left uncorked.

Nota bene—In order to strengthen our hands and increase the usefulness of our Society we particularly request all interested in horticulture to assist us in our endeavours, by giving us information of tests of any description, of new fruits, flowers or other productions within the scope of our Society, diseases or remedies, and in fact all and sundry information that may prove of interest to horticulturists. We will be glad at all times to take up points at our Board discussions upon which any member desires information, and advise with any member to the best of our ability.

KENT, WEST.

The Directors of the Society meet the members to-day with the same degree of satisfaction that the officers of previous years have, inasmuch as they can report favourably as to the steady advance and prosperity of the Society. The state of the finances are not such as to enable the Directors to carry out such measures as they would like, yet a great deal is done with the funds at command, and the increasing excellence of stock and products is owing mainly to our various exhibitions and the spirit of emulation which they create amongst exhibitors. When we look back at the first exhibition of the Agricultural Society, which was held in the fall of 1842, on the corner where the Rankin House now stands, and compare the exhibitions of those early days with these of to-day, we have every reason for congratulation. A marked improvement in stock is observable every year, and, with our facilities for stock-raising, there is no reason why the county of Kent should not stand first in the Province for this department of agriculture as it now does for cereals and roots.

The Society held the Annual Spring Fair, at which there were 30 entries against 29 of the previous year, some new horses were shown, and altogether the exhibition was in advance of former years.

The Annual Fall Fair was, as usual, a success, there being 1,362 entries against 1,312 for 1878, and 1,292 for 1877. And notwithstanding the fact that the weather was bad, there was a large attendance during the day and evening.

A ploughing match was held in the fall, but owing to the morning being rainy, and other matches being held in some of the townships on the same day, there were not a great many entries; there was, however, some very good work done.

Your Directors purchased in the spring, from first-class breeders, three Durham heifers and a bull for the improvement of stock. Although the cost attending the purchase and sale of this stock was considerable, there was no loss in a pecuniary way.

Your Directors believe it would be to the advantage of the Society if it could be arranged to hold the Fall Fair earlier in the season. Finer weather could be depended on, and in many other respects it would tend to make the exhibition a greater success. The Provincial Exhibition this year commences on the 20th day of September, and will continue for two weeks, and presuming the Western Fair to follow the next week, and ours the week after, would throw us into the middle of October. We would, therefore, suggest to the incoming Directors to hold the exhibition about the 21st or 22nd September, believing that although it was held during the first week of the Provincial Exhibition it would be better for the Society.

Your Directors also beg leave to report that during the past year an arrangement was entered into with Mr. John Northrow, whereby the Society was to purchase from him twenty acres of land for exhibition grounds, giving him our present land in exchange as part payment. It was subsequently found that your Directors could not carry out this agreement, as they were unable to make a satisfactory title to the lands proposed to be given as part payment.

Your Directors also beg leave to report that, in consequence of the Barrack ground having been acquired by the town for the purposes of a public park, the Society will be unable to occupy those premises for exhibition purposes, and the first thing to claim the attention of the incoming Board is the providing of a proper place to hold exhibitions.

Your Directors also beg leave to report that the Government has paid to the Treasurer of the Society the amount claimed by the Society for repairing the drill-shed, which was damaged by fire about a year and a half ago.

Raleigh.

The President and Directors of the Raleigh Agricultural Society beg leave to report:

That the Society, financially, is sound, having cash on hand, $182.27; notes due and uncollected, $308.43. The only liabilities is cash borrowed for payment of seed grain, with small accounts, say $428, leaving $62 to the credit of the Society.

In the beginning of the year your Directors purchased a thoroughbred bull and a car load of seed peas. The bull was sold to the highest bidder to keep on special conditions for the use of the members, which was a loss financially to the Society, yet we believe a gain indirectly to the members.

We believe that farmers must take more interest in breeding cattle, using thoroughbred bulls, as the prospect for the price of common cattle in the future seems to be almost nothing. We are glad to say that some farmers in the southern portion of the township have individually imported some very fine animals. We hope to see farmers assist in promoting the Society, in order that it may have funds to increase the importation of stock.

Your Directors petitioned for a lease of land for a number of years for holding shows, etc., which we are glad to say was granted. We hope the Directors for the coming year, with the aid of its members, will succeed in finishing the fencing thereof, as it will then be of great benefit to the Society.

Your Directors held their Show as usual, which, with the exception of home manufactures and ladies' work, was better than for many years. We believe it a benefit in keeping up our Show, as by so doing farmers can compare their stock and other articles with their neighbours', and thereby see many defects in them which they would not if they kept them at home and saw nothing better, thus stimulating them to improvement.

Pigs, composed of Suffolk, Berkshire and Poland China, are the first in the county, as reference to the county prize list will show. Sheep also keep to the front. Both long and short wool are bred, of which many of the latter have been imported into the township the past year.

Your Directors hope by an increased membership and a united effort on the part of its newly-elected officers to make the Society for the coming year more of a success than for many years.

KINGSTON, E. D.

In accordance with the published notice, the Society's Exhibition was held in the drill-shed, on the 11th day of July, 1879, at which, in the classes of plants and flowers, vegetables and poultry, the samples entered for competition were very good, but not so extensive as should have been in so favourable a season as the one this year. The specimens of small fruits were good, but limited in quantity. In the department of fine arts and ladies' work the entries were not so numerous as in former exhibitions. A greater effort ought to be made to render these and other classes more extensive.

The Directors regret that the public do not take a more active part in promoting the objects of the Society—without such aid it is impossible and out of the power of the Directors to make the shows so attractive as they might be; and unless greater interest is manifested by the citizens in carrying forward the working of the Society, it will be necessary to consider whether or not it will be advisable to allow the shows to cease.

LAMBTON, EAST.

In presenting you this, the Fifth Annual Report of our Society, we have pleasure in repeating former reports that the Show for the past season was the most successful yet held, in respect of number of entries, amount of prizes paid, and amount of receipts. In former years the village having the show did her utmost in assisting and helping on the Fall Exhibition, but it was the reverse with Forest; the facts are that much of the preparations were finished on the first day of the show, by the outside Directors and assistants, which in a measure accounts for the apparent excess of caretakers' expenses.

Agricultural implements are still improving, and we are pleased to state that the three firms in the Riding compete successfully at Provincial and District exhibitions.

Cheese at midsummer was very low but late, and now is as high as ever in this section. Dairymen are more hopeful, and on the whole have netted profit. Grain, more especially fall wheat, was a good yield, the price being higher than for years, and direct shipments

being made to the world's market—Britain—farmers are getting the highest possible price for it. Root crops are a good average. The fruit crop was immense and very fine. Thousands of barrels of apples were shipped direct to Liverpool, and netted careful and particular packers handsome returns. Carelessly packed apples were a loss, in some cases not realizing the freight charged.

Horses and cattle are improving; more especially can this be said of the Shorthorn class, a number of really fine animals being raised in the Riding.

The suggestions urged for the past three years in awarding medals for first-prize animals was adopted last season, and worked admirably; a saving of over $40 cash was made, and the successful competitors better satisfied; were it not for those medals the prizes awarded would show over $800.

We would suggest to our successors that the prize list be printed in pamphlet form, as for Watford Show in 1876, when the advertisements interspersed through the list paid for the cost and $18 surplus; that the show be open to the public till 9.30 p.m. first day; ladies' department be more varied, and the premiums increased. It is a fact that the majority of paying visitors (gate money) go purposely to see the ladies' handiwork and manufactures.

There was a slight falling off in membership this year; however, we are far ahead of our neighbouring Ridings in respect to membership, entries and larger premium list, only one Riding west of Brantford exceeding ours in number of entries, and still we carry a surplus of $300 to next year's account.

In looking back over last year's results and returns, the farmer in particular has reason to thank the Giver of all good gifts for the large share of prosperity we enjoy.

LANARK, NORTH.

The North Lanark Society is still prospering. Our annual Exhibition was held on the Society's grounds in Almonte, on the 1st and 2nd October last, and proved a very successful one, there being a large number of entries, and between four and five thousand visitors present.

The exhibition of live stock was larger than ever, and generally considered of a better class. The grain and root departments were not up to the exhibits of last year. This is in part accounted for by the effects of June frosts, ravages by potatoe bugs, and other troublesome insects, and some unaccountable blast that affected all the spring wheat crop. In coarse grains we had a very fine display. The exhibits of domestic work, home manufactures, and ladies' and artists' work were large, and of good quality, and proved interesting and satisfactory.

LANARK, SOUTH.

The annual Fall Exhibition was held on the grounds of the Society at Perth, on Thursday and Friday, October 9th and 10th, 1879. The weather being fine, the show was perhaps one of the most successful held under the auspices of your Society, the number of entries being very large, and the quality of the exhibits generally of a very high order of excellence. The receipts at the gates were very good, the attendance being large, especially as no extra inducement had been offered to the general public.

On account of the state of the finances, the usual ploughing match held in connection with your Society was dispensed with for this year, your Directors feeling the urgent necessity for a rigid economy in the management of your affairs. They have to report a considerable reduction in the liabilities of your Society, although the amount still due by it is very large, being as follows:—

Mortgage on grounds	$600 00
Balance due John Keays	50 00
Total	$650 00

Now that the debt is reduced to more moderate proportions, your Board of Directors would beg to call the attention of the members, and their successors in office, to the urgent and pressing necessity there exists for some kind of accommodation or shedding for live stock. They are satisfied that no outlay would repay the Society better, in fact some shelter is indispensable, as the absence of it causes most of our best breeders to be extremely indifferent in making entries and showing fine stock, especially during uncertain weather, inasmuch as no premiums awarded would make up for damage done to improved stock exposed during a rainstorm.

Your Directors have to report an increasing interest taken in the affairs of the Society by the public at large, and trust there is an era of prosperity in store for it.

LENNOX.

Your Officers and Directors have to report that during the past year we have had a bountiful harvest, and our county has not been visited with any contagious disease to man or beast, for which we as a people ought to be very thankful.

During the past season we held our annual Exhibition, which in comparison with former years will compare very favourably, clearly shewing that the farmers of our county are taking a deeper interest in the improvement of all kinds of stock. And to further this your Directors are of opinion that a law should be enacted that no person should be allowed to move a stallion in our county until first having obtained a certificate from some Board duly authorized to grant such certificate, and duly licensed. The importation of thoroughbred stock into our county is being appreciated, and will have a tendency to improve our stock of cattle.

In agricultural implements the display was the best we have had at similar exhibitions—many exhibitors from Hamilton, Belleville, Guelph, Brockville, and other places in the Province. The grains, roots and vegetables exhibited were of such a character and quality as would be found at our Provincial Exhibitions. Your Directors regret that the ladies of the county did not take a greater interest in exhibiting at our Exhibition, but hope that the matter will receive more attention in future.

Your Directors would recommend that the claims of our Society should be brought before the farmers and mechanics of our county, and every laudable effort should be used in order to get them to feel interested in the agricultural and mechanical interests of our county, by subscribing to and patronizing our county Exhibitions.

Your Directors are of opinion that if the Government grant was kept in full—and not distributed amongst township societies—it would do more to promote the object for which it is given, than distributed in the present manner, as township societies confine their membership to a very limited number.

Amherst Island.

The annual Exhibition was held on the 10th of October, 1879, at the usual place. The attendance far exceeded that of other years, and the Fair on the whole was pronounced quite a success. There was quite a delay occasioned by the steamboat being rather late arriving, and some of those present grew quite restless. However, when the steamer *Hastings* arrived, which conveyed most of our judges, their respective duties were quickly pointed out to them, and they discharged their work with promptitude, giving general satisfaction.

In the department indoors where the farm produce was displayed, there was a large assortment of roots, particularly potatoes, that in size could scarcely be surpassed, and the judges were brought pretty well to task to discern between them which were worthy of the first merit. The next place where their ability as judges was seen was in the fruit department, where larger or finer flavoured apples could scarcely be found. The barley exhibited was bright and plump. The other department upstairs was for ladies' work, and carrying out the rule suggested by one of the members of the Committee, three ladies were invited to act as judges, and the suggestion proved of great value, as

the ladies (although small inducements were offered, but gradually from year to year increasing) showed some excellent specimens of needle-work, and had the decision, as formerly, been left to gentlemen judges they would have been completely nonplussed. In the outdoor classes the stock was much as usual, no particular breed except in sheep, which were as heretofore of high order. There were some fine horses exhibited, both young colts, mare and draught horses.

The crops were much below an average, with the exception of hay. The wheat crop may almost be considered a complete failure here, and all that was raised would scarcely supply the inhabitants for their own consumption until the new crops are ready for harvest. It is to be hoped matters will, when they come to the worst, take a turn for the better, and that if we are spared to see the harvest of 1880, there will be a different story to report.

We cannot close our report this year without alluding to the gap that is opened amongst our members by the hand of death; we allude to our ex-Reeve, Mr. Wright, who was always ready to give us a helping hand in building up our Society, and whose valuable services were always freely offered when required, and we should, as in duty bound, express our heartfelt condolence to the surviving members of his family, bereft of a kind and loving husband and parent, and an active member of this Society, as well as in every other capacity where his services were needed on the island.

MIDDLESEX, EAST.

Your Directors, in making their Annual Report, are required to give an account of their proceedings in the past year, and also to notice anything worthy of remark concerning the agriculture of the county, coupled with such suggestions as they may think would be useful. In reviewing the past season we have great reason to be thankful for the continued prosperity of the cultivators of the soil, and the abundant returns that have in nearly all cases rewarded their labours. The only crops that were much deficient were spring wheat and peas. There is something mysterious about the failure of spring wheat, as neither the state of the soil nor the season would seem to account for it. We believe the most likely remedy would be a change of seed, procured from some locality where the grain had attained perfection, as it is not likely that seed grain shrunken—as most of our spring wheat was last season—would possess sufficient vitality to produce a good crop. With regard to peas, we know what is the matter, and we believe that if proper means were taken it would not be difficult to provide a remedy. The bugs that have injured our peas for some years past have now become so numerous that they almost entirely destroyed the crop the last year, and we have learned by experience that there is little hope of getting rid of them unless we cease sowing peas entirely for one season. This, we believe, would be a perfect remedy, as, according to the best authorities, the mature bug only lives one season, and it seems certain that they must be annihilated if there were no peas in which to propagate their young. But we are aware that this object can never be attained by the voluntary action of the farmers; although the great majority have determined not to sow peas, still there will always be a few in each township who will sow enough to preserve the breed and perpetuate the pest. We would, therefore, strongly recommend the Legislature of Ontario to pass an Act permitting County Councils to prohibit the sowing of peas in those counties infested by the bug. To show the importance of this matter, we may mention that at a very low estimate the damage to the pea crop in the county of Middlesex alone, the past season, has amounted to at least $100,000. We know that the Government have always shown a desire to do anything in their power to promote the prosperity of the farmers, and if their attention is called to this matter by a report, emanating from a body so influential as the Agricultural Society of East Middlesex, we have no doubt they will institute inquiries on the subject that will most likely result in securing the object we have in view.

The success of the Western Fair in 1879 has been all that we could hope for, and has far exceeded what we, at one time, had reason to expect. When we thought of the

extraordinary efforts made at Toronto to provide splendid accommodation for their show, and the advantages they would derive from the additional attractions of the persons of the Governor-General and the Princess, volunteer reviews, regatta, public balls and everything that could be thought of to draw the crowd, and we also knew that the Hamilton Central Fair would be held the same week as ours, ready to intercept visitors returning from the Provincial at Ottawa, and, worse than all, when we learnt that the Governor and Princess, instead of being present at our Fair, as was expected, would visit the city two weeks previous, we naturally feared that all these counter-attractions would prevent the attendance of a large number of both exhibitors and visitors at the Western Fair, and consequently very materially diminish our receipts. But you will be pleased to hear that the result has proved that our fears were groundless and has inspired us with confidence that if we are blessed with fine weather during the week of the show we can depend on the people of this part of Ontario to support the Western Fair in spite of the rivalry of all the other exhibitions in the Province. Instead of our receipts being diminished you will see by the Western Fair accounts that have been distributed amongst you, that we received for admission fees the sum of $8,524, being $1,382 more than we received at any previous fair. We have also increased our surplus from $4,209 in 1878 to $5,459 at present, being an addition of $1,249 profit on the year's operations, and this, too, although we have paid an extra charge of more than $800 for permanent improvements and the expense attending the exhibit from Manitoba. Your Directors have taken a great deal of trouble the past year to carry out a system with respect to admission tickets, that is calculated to assure us that all our receipts are properly accounted for. We believe that in former years our funds have been honestly handled, but we had to depend in a great measure on the honesty of our officers, but the plan we have now adopted will be more satisfactory to the officers, as well as the members, by removing all ground for doubts, as it is impossible for anything to go wrong without being detected. With respect to the exhibition itself, you saw it for yourselves, and it is needless to enlarge. Your Directors have had the pleasure of reporting at each annual meeting since it was established that the last show was the best, and we are certainly warranted in making the same statement, and we hope that for many years to come its progress may be such as to justify the same report.

We again desire to re-affirm the resolution that the price of the land formerly owned by you on Talbot Street should not be expended without the consent of the members, at an annual meeting or at a special meeting called for that purpose. It is now deposited in the Agricultural Trust and Loan Society, at 6½ per cent. interest. By a resolution of your Directors, passed a short time since, it is to be removed to another institution at 7 per cent. The Treasurer will present you the detailed accounts of our Society, and can explain to you the position of our reserve fund, when the Directors will be glad to take the advice of the members present with regard to the disposition of the funds in future. It is a pity that a greater number of the farmers do not join our Society and attend the annual meetings. They should not forget that although they enjoy equal rights as exhibitors by paying their dollars at the time of making their entries, still they practically exclude themselves from all share in the management unless they become members, and attend the annual meetings, to aid, by their vote and influence, in getting matters managed as they wished. We learn that the City Council for 1879, at their last meeting, decided to take another vote of the citizens on a by-law to sell the exhibition grounds. This, we have no doubt, will result, as all former votes on that question have done, in a large majority against the sale. If we assume that the citizens of London are really in favour of a continuance of the Western Fair, and of having the Provincial here in its turn, we may safely predict that they will not vote for the sale until they are fully informed on the following points, viz.:—First, that arrangements have been made to enable them to sell the whole of the grounds, as to sell only that part west of Wellington Street, over which the city has sole control, would be to ruin the present grounds without providing means to procure others; secondly, if the present grounds were sold, where is it proposed to get new ones, so that they may have an opportunity of deciding on the advantage of the site proposed as compared with the present one?—at any rate, that is the way we do business in the country: we would never think of trading off a good horse without seeing

the animal we were to get in exchange: thirdly, they would require to see some reliable estimate of what the present grounds would sell for, and what would be the cost of new grounds and buildings, so that they would be in a position to judge whether it is not as likely to add to the financial difficulties of the city as to relieve them by taking action in the matter at the present time. There is no doubt that the uncertain tenure of the present grounds is an immense disadvantage, and if some well-considered, definite plan were proposed, either to make the present grounds permanent or to provide others, we should be extremely well pleased to see the question finally settled.

Western Fair Association.

The Directors, in surrendering the trust reposed in them at the beginning of the past year, feel it incumbent upon them to render to you an account of their stewardship. In doing so, they feel justified in prefacing their report by the statement that, all things considered, the Western Fair for 1879 has been the most successful yet held.

Taking into account the gigantic effort made in Toronto—an effort unrivalled in the history of this Dominion, and in which neither means nor labour were spared to render their three weeks' Industrial Exhibition an absorbing success, so absorbing that even the Provincial Exhibition, with its bonus of $10,000 paid from the public purse, was expected to pale before it, and such cities as Hamilton, Guelph, Brantford and London, where fairs had been instituted, would prove failures, and probably cease to exist, thus leaving Toronto as the only place in which it might be supposed such fairs could for the future be successfully held; the difficulty experienced in removing stock and other exhibits from Ottawa to London in time, the holding of the Central Fair at Hamilton during the same days, and the anticipated visit of the Governor-General and the Princess Louise during the Fair week, but which for us unfortunately took place two weeks previously, were serious drawbacks to the Western Fair; yet with all these disadvantages the receipts were larger than in any previous year. Our prize money was promptly paid, as were also all working expenses. An available asset of say $600, in the way of shafting, and of material used in the construction of Manitoba Hall, is on hand, and a surplus of $1,250 in cash placed to credit, as will be seen by reference to financial report.

An effort was made to place before the visitors of the Western Fair the Manitoba exhibit as shown at Ottawa, but although a large expense was incurred, the delays of transport and other causes made what would have been a great attraction almost a failure.

Favourably for the Association the weather was propitious, and the number of exhibitors and large concourse of visitors prove that the Western Fair retains its prestige, and having been the first of such Associations in the field it will continue to hold its pre-eminence despite all rivalry.

The Directors resign to you their trust. They have given their services willingly and gratuitously. They feel that thanks are due to the railway companies for the facilities afforded to exhibitors and visitors; to the judges who performed an onerous duty, and to the exhibitors and members of the Association generally; and they believe that by a proper discretion on your part in the selection of Directors, and by a judicious economy on the part of such Directors, the Western Fair will prosper in the future as it has in the past.

MIDDLESEX WEST.

The Spring Show of horses was tolerably successful. The Fall Exhibition was not as successful as that of 1878, the number of entries not being as large; and the space being larger caused the smaller number of entries to be more observable than would have been had there been only the usual accommodation. The weather also being very unfavourable on the morning of the second day, probably prevented many persons attending.

The Horticultural Society of Strathroy having seen fit not to unite with this Society in the Exhibition very materially influenced the general result, but on the whole there is ground for congratulation in a financial point of view, for after paying off our indebted-

ness to our late Treasurer of $74.19, and Fawcett's account for lumber in 1878 of $18.19, there is still a balance on hand of 37 cents.

The year 1879 was remarkable for very few of the products of the farm maturing thoroughly. The weather in spring set in very dry, and the summer was extremely hot, with frosts early in the fall. The following is an estimate of yield per acre of the several kinds of grain and roots:—

Fall wheat	20 bush.	Spring wheat, almost a failure.	5 bush.
Peas, almost a failure.		Oats	30 "
Barley	20 "	Indian corn, shelled	35 "
Potatoes	70 "	Carrots, almost a failure.	
Turnips	600 "	Mangolds	500 "
Hay	1 Ton.	Fruit, good crop, especially apples.	

Apples were generally a good crop in this country, and fetched a good price in England, where the crop was poor. Good apples will always bring good prices—another reason why growers should have the best kinds.

The very fine weather in the latter part of the fall gave a most luxuriant growth to the fall wheat, so much so that many farmers turned in their cattle to eat it down; it looks well at present. As we may expect some severe weather before spring opens, we may hope the strong growth may protect it from the frosts. As the price of wheat has been good, a large breadth of it was sown. As good articles will bring good prices it should be the aim of the producer to have good articles, whether stock, grain, cheese, or butter; always aim to have the best of everything you produce. * * *

Ekfrid.

The Directors of the Ekfrid Agricultural Society in presenting their annual report for the year 1879, have reason to congratulate themselves and the members of this Society on the measure of success which has attended their efforts during the year now drawing to a close. While they regret having to report a falling off in membership as compared with previous years, and a consequent reduction in their prize list, and while they would have liked to have made a better classification of animals and articles for exhibition, but could not for lack of funds, yet on the whole the Show held in conjunction with the Township of Mosa Agricultural Society was in every respect highly creditable to both Societies.

The stock shown was not so good as that shown the previous year, as the season was so dry and pastures so short that most of the animals in this section of country were in low condition, which had the effect of considerably reducing the number of competitors in the different classes.

Your Directors have further to report that they entered into an arrangement with the Township of Mosa Agricultural Society by which they secured the lease for nine years of a very commodious piece of ground on which to hold their shows, and that they were able to secure the erection of a hall at a cost of four hundred dollars, one-half of which was paid by the appropriation of the funds collected at the gates, and the other half provided for without in any way crippling or burdening either Society.

Your Directors are of opinion that the union of our funds with the funds of the Township of Mosa Agricultural Society for show purposes is an arrangement highly beneficial to both, and they would take this opportunity of recommending to their successors its continuance.

The crops the past season have, with some few exceptions, been good; fall wheat in some sections was damaged by June frost. Oats in this township were very much injured by grasshoppers; peas almost totally destroyed by bugs. Hay in consequence of the early dry weather was light. Yet taking everything into consideration the farmers of this section of country have no real cause for complaint, and with all their grumbling are as prosperous and happy as any other class in the community.

Your Directors feel that they would be very remiss in the discharge of their duty did they allow this opportunity to pass without pointing out some of the things that in their judgment would better the condition of the farming community in particular, and the whole country in general.

1st. Better cultivation of the soil, ploughing less, and seeding down more to clover.

2nd. More thorough drainage.

3rd. Getting and keeping a better quality of stock, keeping fewer of them and keeping them better, so that more ready sale and better profits may be secured.

4th. Following a mixed husbandry, instead of making any one thing a speciality, so that we shall not be so dependent on the price of any one commodity.

5th. Taking some good agricultural paper so that we may have the experience of others engaged in similar pursuits, and thereby be prepared to go intelligently to work to secure the best possible results.

Strathroy Horticultural Society.

Your Directors take pleasure in reporting a highly prosperous year in the Society's operation. Our Show was held on the 26th, 27th, and 28th days of August, which was a decided success as regards the entries, there being 181 in flowers and plants, 29 in fruits, and 62 in roots and vegetables, or a total of 272. Notwithstanding the dryness of the season, the display of flowers was very fine and showed that there is a growing taste in home adornments in this neighbourhood, especially among the amateurs, and your Directors believe the Society is doing a good work in stimulating this branch of industry.

The amateur and professional prize list being kept distinct from each other, for the first time, was found to work satisfactorily for both, more especially for the amateur, and we would recommend a continuance of the same. Your Directors would also recommend that only one Show be held this season, about the first week in September, believing that we would have a larger display of fruits and vegetables at that time.

Your Directors cannot conclude this report without acknowledging the very valuable services of the Rev. Robert Burnett, of London, President of the Fruit Growers' Association of Ontario, as one of the judges on fruit, and the valuable information he gave to the members of the Society and fruit growers of the town and neighbourhood; and would cordially thank all those who so liberally aided the object of the Society by subscriptions and otherwise, and trust that the present year may witness a continued and increased support.

MUSKOKA AND PARRY SOUND.

The Directors present the following report for the year now ended:

The number of members was 113 (a decrease as compared with the previous year of 23), and the amount subscribed by them, $115.

Last spring the Board entered into an arrangement with the Bracebridge Cricket Club, by which an annual revenue is derivable from the show-ground, which has been rented to the Cricket Club, and has been stumped, cleared and drained, at a cost of $190.75, and has also, by the personal exertions of some of the Directors and others, materially assisted by the liberality of one of the Board, been ploughed, levelled, and seeded down. A pump has also been placed in a convenient position on the ground. All this necessitated a considerable outlay, but it cannot be regarded otherwise than as a good and permanent investment of the Society's money, and it is to be hoped that each succeeding year will present some new feature of improvement in the Society's beautifully situated grounds, and this can only be effected by unremitting care and attention.

The receipts at the show-ground gate last Fall Show amounted to $73.79, being $14.03 more than the money taken the preceding year.

The Directors regret that a farmers' excursion on the Nipissing, on the 26th of June last, was not sufficiently patronized to prove a success financially, and the more so, as A. P. Cockburn, Esq., who has always acted most liberally with the Society, and takes a great interest in its welfare, was a sufferer on the occasion.

The following are statistics relating to the last Fall Show :—There were 368 prizes offered, amounting to $502.50 ; also 4 special prizes. The division of the prizes offered was as follows: in numbers, for horses, 36 prizes; cattle, 61 ; sheep, 36 ; pigs, 18 ; poultry, 20 ; produce, 100 ; manufactures, 37 ; and ladies' work, 60. Diplomas, 11 in number, were offered only for the best sire animal in each class of horses, cattle, sheep, and pigs, irrespective of age, and were not regarded as money value. The amounts of the prizes offered in each class were : for horses, $77 ; cattle, $113 ; sheep, $63; pigs, $31 ; poultry, $13.25 ; produce, $108 ; manufactures, $44.50 ; and ladies' work, $52.25 ; total, $502.50. The number of entries was 686, being 116 more than those in 1878. Of these 68 were for horses, 49 for cattle, 51 for sheep, 14 for pigs, 21 for poultry, 308 for produce, 31 for manufactures, and 144 for ladies' work. In comparison with the preceding year, the entries in the different classes are as follows : In numbers, an increase in horses of 22 ; produce, 76 ; manufactures, 18 ; and ladies' work, 66 : and a decrease in cattle of 20 ; sheep, 22; pigs, 15 ; and poultry, 7. The value of the prizes obtained by the exhibitors amounted to $372, appropriated thus: horses, $77 ; cattle, $47.50 ; sheep, $50 ; pigs, $14 ; poultry, $10.75 ; produce, $103.50 ; manufactures, $22; and ladies' work, $47.25 ; total, $372 ; being thus an increase over the preceding year in money given at the Fall Show, of $84.50, including special prizes both years, but an increase of $108.50 in prize money given by the Society alone; and if the December Fair, to which allusion will be made hereafter, be taken into consideration (and at which $15 prize money was awarded), the increase in prize money given amounts to $123.50 ; the total prize money awarded being $387—the largest amount as yet awarded since the formation of the Society. The superiority in quality as well as in the quantity of the thoroughbred animals exhibited at last Fall Show must have struck anybody then present who had attended former exhibitions of this Society, and it elicited high encomiums from some of the judges from the front who had previously acted in the same capacity. The exhibition of produce was highly creditable, and in the ladies' work department a marked improvement was visible.

Last March the Board determined to give further encouragement to the farmers in the district by holding a Fair on the Society's grounds in December, and at the same time a Fat Cattle Show. The Fair, to give farmers and others an opportunity of disposing of or changing stock, and the Show for fat stock (cattle and sheep), to encourage members in that particular department ; prizes were also offered, amounting to $10 for fat cattle, and $6 for fat sheep, all of which were awarded, excepting a third prize for sheep. On the same day an auction was held on the grounds by Messrs. Roper & Groom, but owing to the unfortunate state of the weather—a hopelessly wet day—buyers, who were invited and expected from the front, did not attend.

Your retiring Board trust that their successors will carry out their intentions (as expressed in a resolution passed the 12th of March, 1879), of holding such fairs and shows in the months of April and December. It is difficult to ascertain the condition of the several Township Societies, as no report of their proceedings during the year is sent in by any of them to this Society. The balance sheets alone tell anything, and they do not show as much money to the credit of the Societies as there was this time last year.

In conclusion, your retiring Directors congratulate the Society on the position it now holds, and, from the progress it has made in the past, anticipate for it a bright future.

NIAGARA E. D.

The Officers and Directors of the Niagara Electoral Division Agricultural Society take great pleasure in presenting to the members their twenty-first annual report. At the annual Show and Fair there was a marked improvement over past years, owing to the fine weather for the display. All live stock at the Exhibition was far above the average in quality and quantity. The display of fruit, for which Niagara has a wide reputation, was far in excess of the expectations of this Society. There was a splendid array of grains, roots, etc. The exhibition of fine arts was far above the average, with a splendid display of flowers to set off the shelves, looked strange to eyes accustomed to see

most of the door-yards in this division, and we think if the members would display more taste by ornamenting their homes with flowers and making them wear a more cheerful appearance, it would no doubt entice their children to stay at home on the farm, and not to seek pleasure in cities and towns.

Owing to the advance in the price of wheat over the previous year, we think that the press called the "Hard Times" is nearly at an end for farmers. This uplook of the markets is no doubt owing to the coöperation of farmers under the grange system, against rings and monopolies, and we think a still more healthy coöperation would no doubt better the circumstances of most of us; the time has arrived when agriculturists will no longer be ground down by rings and monopolies, but rise up and assert their independence, and make themselves felt, as they are, the bone and sinew of the nation. But this can only be accomplished by a union of interests.

The prices realized on all fruits this year was far above any expectation. As our entries have increased to such an extent, we would strongly recommend that the Exhibition be held for two days, for it seems almost a pity so few people can avail themselves of the opportunity of witnessing so fine a display of fruits, flowers, vegetables, and other farm products of all kinds. We would also recommend that your Society, at its earliest convenience, should make application to the Dominion Government for sufficient ground for a show ground, and then for us to erect thereon suitable buildings for the accommodation of its members. We think that this Society should bring to bear its influence on the Local Legislature, to pass a bill to prevent the spread of a disease among peach trees, known as the "yellows."

NORTHUMBERLAND, EAST.

The Annual Show of the East Riding of the County of Northumberland Agricultural Society was held in Warkworth, on the 9th and 10th days of October last, and proved to be the most successful, upon the whole, that has hitherto been held by the Society. The weather was very favourable, and upon the second day was the largest crowd of visitors ever noticeable on any occasion of the kind. In regard to the progress of agriculture generally, your Board has every reason to believe there is a gradual improvement. Farmers are providing themselves with labour-saving implements, and there is also a growing desire for the acquirement of a better class of stock, and the further introduction among them of pure breeds; nevertheless, a number of our well-to-do farmers have at the present time well-bred animals, and most noticeable in cattle, sheep, swine and poultry. The show of stock, grain, seeds, produce and implements was by far the best exhibition of the kind the Society ever held, both as regards competition and increased interest, the total number of entries being 1,260. In the grain department the classes were all well represented, save spring wheat, which was a failure in this section in yield as well as sample, and we would suggest the importance of our farmers further procuring a new sample of spring wheat, as past experience teaches us the necessity of such change. The last, but not least, in the display at our show was the ladies' department. It would be impossible for your Directors to enter into particulars in this department. It was as good a display as on any such occasion heretofore.

Before concluding their report, your Directors would further suggest the propriety of farmers in general, who are in the habit of raising cattle for the English beef market, to procure a breed of cattle that would come up to the standard in said market, as you are aware that our grade cattle, being ever so well fattened, would not command the price of Durhams or other large breeds.

Brighton.

The moneys received during the year, with the balance on hand, amounted to $311.91, and the expenditure to $257.20. We have had during the past year 100 members. The number of entries was not quite equal to the previous year. The show of cattle was as good as the previous exhibition, also that of horses and colts was as good as could be rea-

sonably expected, an improvement on some previous exhibitions. The display of roots and apples was good, the season being favourable. Grain exhibition, excellent. Sheep and pigs, good. Fowls were equal to or superior to any former exhibition or county show. In the ladies' department the exhibition was as good as usual. The Show, taken as a whole, was an average; the entries a few less than the previous or last Show held here in 1877.

Cramahe.

Your Directors, in presenting their report for the year just passed, desire to express their gratitude for the blessings of a bountiful Providence that has so ordered affairs that we have had peace in our land, an abundant harvest and remunerative prices, so that means have been supplied us to maintain, and, we believe, to increase the usefulness of the Society.

The Annual Exhibition of your Society, which was held in Castleton, on Friday, October 17th, was fully equal to the average. The display of horses was about an average one, while some of the colts and young horses were ahead of former shows, and, we believe, that if greater care was exercised in the selection of stallions, it would result in still better horses, to the satisfaction of breeders. In cattle there were about the usual number and of about the average quality. Our attention was directed to a really good Shorthorn bull, exhibited, for the first time, by W. H. Cochrane, Esq., and we hope that his example will be followed by others. While the show of sheep was not quite equal to some former years, the show of pigs was ahead of any former year. Poultry was not quite up to the usual mark, either in quantity or quality, although there were some good fowls. In grain there was a good display, this part of the country being specially suited for a good growth of fall wheat and barley. There was fortunately a considerable amount of land devoted to their culture last year, which yielded well and sold at good prices. We also notice that there was more than the usual number of acres sown with wheat during the fall. We would also call attention to the fact that where proper attention has been paid to the change of seed, and procuring the best kinds, good crops of spring wheat have been raised. More attention appears to be paid lately to the growing of roots, of which there was a good display, potatoes, turnips and mangolds especially. The fruit was a splendid show, as regards variety, quantity and quality, our township being noted for having some of the best orchards in this part of the country. As usual, there was but a very small display of agricultural implements, an agent of a firm in Hamilton making the only display. Your Directors believe that it would be well worthy of consideration to open the competition in agricultural implements to the Province. A few buggies and cutters, and some cabinet work, finished the mechanics' work; the prizes are good; there should be greater competition. Domestic industry was really one of the remarkable features of the show, while the dairy was exceedingly well represented. There are cheese factories within reach of nearly all of the members of the Society, and where they have been properly managed they have been a source of profit to the patrons. As was to be expected, the ladies' work was a great attraction, but there was such an amount shown that it had to be crowded, so that the effect of the display was in a measure lost. We are sure that the judges must have had a very hard task where all was so good.

Your Directors regret to have to announce that Death has made another inroad in our membership, this time in the person of Joseph Jaques, Esq., the President of our Society for 1878, and for many years a useful officer and member.

Your Directors have great pleasure in stating that the receipts at the door show that the exhibition was better attended than any former one in Castleton.

Your Directors take pleasure in stating that the number of members is yearly on the increase in this township, and that while we have a less amount of Government grant than usual, owing to other townships having increased their membership faster than we have, yet the Auditor's report, which will be laid before you, will show a balance of $13.93 to your credit, which we hope will be satisfactory.

Your Directors believe that there is now a better prospect before the Society than for several years past, owing to the commencement of better times. * * *

Seymour.

Your officers and Directors further report that during the winter they secured a lecture on Agriculture, in the Music Hall, Campbellford, by the *Witness* Agricultural Editor, Rev. W. F. Clarke, at an expense of a little over seven dollars for rent, telegrams, etc. (admission being free). The attendance, though not very large, was fair. The result, a few new subscribers, and for some time a discussion on clover as a fertilizer and its value for hay.

Every member of the Society paying his subscription on or before the 1st of August has been furnished with a copy of *The Farmers' Advocate.*

The Annual Show of the Society was held in Campbellford on the 11th of October. In consequence of an appropriation being made in aid of a ploughing match, the premiums offered were low; notwithstanding which, the exhibition of horses, cattle and grains was good, and expressions of a determination on the part of some were heard to do better another year.

The idea of a ploughing match was not carried out, in consequence of the unfavourable condition of the land for ploughing during the entire autumn.

The manufacture of cheese, and wheat and barley growing, have for some time, and still are, the staple articles of produce and manufacture of this township. In the former a decrease in the quantity made, in consequence of drought, and a decline in the price during the summer, has to some extent lessened the zeal of the dairyman, but a more than average crop of fall wheat and an extra price has increased the diligence of our farmers in that direction.

NORTHUMBERLAND, WEST.

The Union Exhibition of this Society with the Township of Hamilton Agricultural Society, held in October last, proved a success beyond the most sanguine expectation of those connected with it, the number of entries nearly 1,600, and what is not always the case, most of the articles entered were on exhibition, making an excellent display, not equalled in the past, as being the expression of those present. After paying over $600 in prizes, and over $550 on purchase of the new fair grounds, there was still left a balance in the hands of the Treasurer of $165.52.

The horses most in favour in this Riding are the heavy draught, agricultural, and carriage horses. In cattle the Durham and Ayrshire take the lead; the Devon and Galloway, which were bred till recently, are at present but rarely shown. The Cotswold and Leicester sheep are bred exclusively, the fine wool breeds being rejected, with but few exceptions. In the classes of grain, roots and fruit, the samples on exhibition were good, and would in quality compare very favourably with the samples exhibited at the Provincial Exhibition, as expressed by several who visited both.

In reference to the yield of grain in this locality, the following remarks will be as nearly correct as can be ascertained:—Fall wheat, about twenty-five bushels to the acre; spring wheat, rather below an average than above; barley, fully an average yield; peas, below an average; roots were considerably affected by dry weather, but some excellent samples were on exhibition; fruit, especially apples, an abundant crop.

Hamilton.

Your Directors are pleased to be able to report your Society in a fairly prosperous condition. Compared with last year the membership is small, there being 168 members in 1878 and only 94 in 1879; but compared with 1877 the difference is quite small, there being just 107 members in that year. The Central Exhibition being held in Cobourg in 1878, doubtless accounts for the large increase of members in your Society that year. Your Directors are fully satisfied that the scarcity of money, consequent on the continued

depression in business generally, and the great scarcity of money among agriculturists in particular, were the principal causes of any falling off in the membership of your Society. And they are of the opinion that the generally good harvest of 1879, together with the advance in the prices of most farm products, and the consequent improvement in monetary matters, will make it much easier to get members for your Society this year than last.

Your Directors deemed it better to adopt the course followed for several years past and to unite with the County Society and hold a Union Exhibition, than to hold a separate Township Show; and they consequently, at a meeting held on the 22nd February, 1879, decided to amalgamate all their available funds with those of the County Society for that purpose. As you are aware, the Union Show was held in Cobourg on the 14th and 15th of October last, and was quite a success. Your Directors also thought it better to continue the prizes for field roots, but in doing so they decided to charge a fee of twenty-five cents on each entry made in that department. Their reasons for doing so were that in years past a number of inferior patches of roots have been entered, and a great deal of unnecessary work has been thrown upon the judges as a consequence; and your Directors are pleased to state that while the course they have taken has considerably lessened the work of the judges, it has not prevented a lively competition, there being 11 entries of turnips, 7 of mangolds, and 5 of carrots, making in all 23 entries, which added the sum of $5.75 to the funds of your Society. * * * *

The judges on roots gave it as their opinion that the turnip crop was considerably below the average yield, but that carrots and mangolds were a fair average crop. * *

Cobourg Horticultural Society.

Your Directors, in presenting this their Annual Report, take great pleasure in congratulating the Society on the successful year just past. By reference to the Treasurer's report you will find the finances of the Society are in good condition, showing a balance on hand of $38.

The two exhibitions of the Society were fully up to the expectations of your Directors. In consequence of the very broken weather, the Spring Show was not quite as good as usual in the fruit, flowers and vegetable departments; but the fine arts were better than former years. All the departments at the Fall Show, held in September, were very good, the number of entries being in excess of former years. The attendance at the two exhibitions was not up to the usual average.

Your Directors would impress upon you the great necessity of increasing the membership of the Society, and call upon the members to exert themselves in this direction.

OTTAWA, E. D.

It is now twelve years since the first meeting was called in the old City Hall for the organization of this Society, under the Act respecting the Bureau of Agriculture and Agricultural Societies in Ontario. It may not be amiss, therefore, at the present time, to give the patrons and the general public some information as to what has been accomplished thus far, especially in the way of building and improvements upon the Society's grounds, and to consider how far the spirit of the resolution passed at the first meeting has been or is likely to be carried out. The wording of this resolution is "That the intention in forming this Society is in view of establishing united action among the different counties of central Canada in the interest of agriculture and the mechanic arts." In accordance with this resolution circulars were sent to the adjoining counties requesting centralization and union, but owing to local feeling and the desire in each section to spend the Government grant near home, nothing was accomplished in that direction. The Board of Directors, however, believing that Ottawa was the proper place for exhibitions on a larger scale than hitherto attempted in the Ottawa Valley, resolved upon going on, and accordingly a prize-list was issued in 1869 with the liberal sum of $2,500 as the first

effort. Meantime the present exhibition grounds had been secured from the Government, and the work of preparation in building and fencing began. Subscription lists were issued and liberally signed by the Directors themselves and many leading citizens (then in a general prosperous business condition), so that after the prizes, &c., were fully paid, there remained in hand $818.15 to be applied to the building account during the year, while the grounds had been fully fenced, and sheds and a temporary hall for exhibition purposes erected. This state of prosperity continued for the five years following, each season being marked by liberal assistance from citizens and in a few cases from outsiders, until we reach 1875, the year of our first Provincial Exhibition, at which date your Society had made such considerable progress as to warrant the Directors in preparing for the Ontario Provincial Exhibition. Our representatives to the Provincial Board, Hon. Mr. Skead and Mr. Ira Morgan, for three or four years previously had contended for this distinction, and this year a large majority of the representative delegates at the annual meeting acceded to the request. It may be of interest here to give the position of your Society, financially, as at that date. At the close of 1874 the Treasurer's statement showed $5,306.76 as the total receipts of the year, and the expenditure $6,061.33, leaving the deficiency at this period as $704.57. Considering that in the meantime the land forming the Society's grounds had been fully paid for, and a large sum expended in permanent improvements, this was not considered other than a satisfactory exhibit. Early in 1875 the Directors, finding that the exhibition grounds would be too small for the Provincial Exhibition, borrowed the sum of $10,000—$8,500 of this sum being expended in the purchase of the brick house and adjoining grounds; the balance of this loan was expended in payment of amount due from previous year, the purchase of cedars, etc., as per audited account for that year; in the construction of the exhibition building, the sum of $35,000 was incurred, of which sum $24,000 was paid, as per audited account; the balance of the $35,000 was partly provided for in 1876 by a loan of $21,000 from the C. P. L. and Savings Company; $11,230 of this amount going to pay W. Mackay's mortgage, and the balance being applied in payment of existing liabilities; but to complete the payments of that year a further sum of $3,600 had to be obtained from the bank on the joint security of the Directors. This amount still remains due, as also the loan from the C. P. L. and Savings Company, making the liabilities at present $26,150 in all, and it is to this matter the incoming Board will want to direct attention, as the interest must be promptly met. It will be seen by the accompanying statement that a sum more than double the present indebtedness has been spent upon permanent improvements, the actual sum being $61,000. In reference to the past year's doings your Directors need say but little. You are aware that Ottawa was again favoured with the Provincial or rather Dominion Exhibition, and it is to be regretted that, while to all appearances, and judging from the large number in attendance, and the general testimony of the citizens, the Exhibition was a great success, the receipts at the gates are reported far short of the high expectation indulged in. So much has been written on this subject already, your Directors deem it unnecessary to enter into the matter at length.

OXFORD, NORTH.

It is with mingled feelings of gratitude and pleasure that we submit to you our Annual Report for the year 1879.

We would be ungrateful, indeed, if we failed to express our thanks for the unprecedented harvest of the past year, and the very many privileges accruing therefrom to this Association.

This is almost purely an agricultural community, and although possessed of a fertile soil, and capable of producing a wide range of products, yet complete success depends very largely on the season. For two or three years prior to 1879 the seasons were unpropitious, consequently crops were below an average, both in yield and quality; this, accompanied by low prices, caused a depression in our entire county. The past year, however, every branch of husbandry, with one or two exceptions, has been extremely prolific, and

being attended with high prices, success has crowned the labours of the agriculturist, the results of which are already seen and felt for good. Let us, then, unite our thanksgiving for the success of the past year, and go forward cheerfully to prepare for the future, hoping that still greater success may result therefrom. Our pleasure arises from the fact that though for many years our progress has been manifested in the increase of membership and improvement of exhibits in many classes, yet in no year has there been such a marked advance in the whole as for the past year. In nearly every section of every class the entries were more numerous, and in many a marked improvement.

The Fall Exhibition, as you are aware, was held much earlier than usual, and the weather unexceptionally fine. To this, in a great measure, must be attributed the unprecedented attendance of exhibitors and visitors.

Another cause for expressions of pleasure is the fact that our financial position is so much improved that we may almost claim to be out of debt; we are safe to say "out of danger," and quite as safe to add that, with judicious management in the future, the Association will take its proper place in the front rank of central exhibitions. No effort should be relaxed in inducing other societies, within the county at least, to unite with this Association for the purpose of enlarging the prize-list, and thus attracting the very best live stock the country can produce. The effect of this was seen the past year in the show of horses. Through the liberality of generous friends, your Directors were enabled to offer large premiums, and the result was a splendid display in those classes, and not surpassed at the central exhibitions. We may argue from this that the same result would be attained in every other class, if we could enlarge the whole list in the same proportion. We need not weary you with referring in detail to each department of the Exhibition, as probably nearly all the members had the pleasure of seeing for themselves. For full details of all receipts and expenditures we refer you to the Treasurer's report herewith submitted; and, in conclusion, would urge upon every member the duty of aiding the Directors in increasing the efficiency of the Association by every means in their power.

Blenheim.

In presenting you with the Twenty-sixth Annual Report of our Society, we would state that we have had a very prosperous year. Our Spring Show was a good fair average of former years. One very noticeable feature in connection with it is the large display of agricultural implements, and we would suggest that the meeting take into consideration the advisability of offering prizes for those in spring instead of, as at present, in the fall. Our Fall Exhibit was a grand success. The show of horses, especially agricultural colts, was decidedly the best ever held in Drumbo. In the cattle ring we found something of a falling off, some of our breeders in Durhams being very conspicuous by their absence. In the Ayrshire class we notice quite an improvement, several new exhibitors being in the field. There were also a number of the Jersey breed of cattle exhibited by Mr. Smoke, which attracted no small share of attention. Your Directors, some two years ago, thought it would be for the best interest of the Society to make a thorough change in the classing of sheep, which was considered by many at the time to be detrimental to the show as far as the exhibit of sheep was concerned; the results, however, have proven quite the contrary, as the exhibit and quality of the animals exceeded that of many previous years. The show of swine was not wanting in breed and quality, there being some very fine animals in both Berkshire and Suffolk breeds. The poultry show was well represented by the many fowl fanciers, in this section as well as from a distance. The show of esculents was equal, if not superior, to that of former years. The dairy products were in large quantities and of excellent quality. The display of agricultural implements was much in excess of former years, the exhibitors no doubt finding it to be to their interest, in a commercial point of view, to attend our Fair, as by thus doing their implements are brought more prominently before the farming community. Upon entering the Hall the visitor was forcibly struck by the very fine display of almost all kinds of fruit and flowers grown in this section of our fair Province. The attractions in the ladies' department were general, and the wreaths, paintings and needle-work could scarcely be surpassed, thus showing that our fair dames can excel in other things besides making wholesome bread and sweet butter.

Our status, financially, is gradually improving. We began last year with a debt of over $62, and we have lessened this so that we are now only some $14 behind, besides paying off during the last twelve months dividends to the amount of $83, while the unpaid prizes foot up, say $63, or about the same as last year. Our dividends on shares are nearly all paid up, and we would suggest to the members the propriety, at an early day, of taking into consideration the purchase of the land we now occupy.

Zorra, East.

Your Directors, in submitting the report of the Society's proceedings for 1879, have much pleasure in stating that the Society remains unencumbered by debt, and in general maintains the high position among Township Societies it has held for so many years.

Our Exhibition for 1879 was a union formed with the South Easthope Society, and was very successful, as the number of entries for 1879 show an increase of 8 per cent. over 1877, and 35 per cent. over the total number of entries for 1878; whether it is owing to the union or what other cause your Directors are not able to determine. In our last Exhibition there was one peculiar feature observable, that of a marked decrease in the number of horses and cattle shown, but all being of a superior quality. In grain and roots the quantity was larger than in former years, and the quality good. Dairy produce was well represented, there being so many samples of good butter that the judges had great difficulty in awarding the prizes. The same may be said of the choice specimens of fruit shown in the hall. The display of ladies' work and home manufactures was excellent, and the Directors beg to thank the lady friends of members for their very successful effort in this department.

We would suggest to our successors in office, that if the union is to be continued they use all efforts in extending the prize list for 1880.

PEEL.

The Directors of the County of Peel Agricultural Society in submitting their report for the year 1879, do so with pleasure and satisfaction.

The Spring Fair was held on the 23rd of April. The entries were the same as they have been for the two previous years, namely, 45—horses 27, cattle 18. The attendance was smaller than the year before. Gate fees, $31.

The Fall Fair was held on the first three days of October. The weather was all that could be desired. The attendance was good and the results favourable both financially and otherwise. Many were afraid that the Toronto Exhibition, continuing so long and having so many attractions, and the Central Fairs of Hamilton and London, coming simultaneously with our own, would destroy the interest in our own Fair, and that it would be a failure; but our local exhibitors came nobly forward, and we had a first class county exhibition.

The horses, as usual, were up to the standard in excellence and number, except, perhaps, carriage teams, the best of which were ruled out as not coming up to the standard of height. The cattle were, as usual not to be surpassed by any in the Province, although it is to be regretted that the number was small. The same remark applies to the classes of sheep and pigs. The show of poultry was much larger than usual, but, with some notable exceptions, the birds were not as good in quality as usual. In the old hall the display of roots, vegetables and grains was large and excellent. In dairy produce the show of butter was of first-class quality and also a large exhibit. The grand attraction of the hall was the large show of fruits. In this class there were 503 entries, against 248 the preceding year. Flowers, as usual, were a rare attraction on the central tables, and the Board would express their obligation to those who, at considerable sacrifice of time and labour, ornament our hall so tastefully. In implements, machinery and carriages there was a falling off from former years. The exhibit of stoves, tools, saws, furniture and woodwork was interesting as illustrating the progress of our Province in manufactures. In fine arts the

judges remarked that the specimens exhibited this year hardly came up to the standard of former years. In the ladies' department there were choice specimens of all kinds of handy-work. The entries this year were 520.

On the whole this was the best and most satisfactory Exhibition which has been held for some years. The total amount of money taken at the gates amounts to $1,325.

The impetus given this year to raising stock for exportation will help to enable the farmer to solve the problem how to keep his land enriched and continue to raise profitable crops.

The Board have paid off $200 of principal of the debt on our grounds, besides the interest. * * *

PETERBOROUGH, EAST.

Your Directors beg leave to submit their report for the year 1879. The usual Fall Show was held at Norwood, on Tuesday and Wednesday, October 14th and 15th, and was one of the most successful ever held by the Society. The entries numbered 1,089, and the premiums awarded amounted to $510, both considerably exceeding any previous year. And whilst pleasing to note the increase of exhibits and exhibitors, it was no less gratifying to see the general interest taken in the Exhibition, as manifested by the very large attendance of visitors during the days of the Fair; the net receipts at the gates amounting to $234. The show of stock was a decided improvement on any previous Exhibition. In horses, of which there were sixty-five entries, the show was fair, but on the whole there is still room for improvement. Of cattle there were forty-three entries—Ayrshires and Durhams being about equally favourites. The farmers of the Riding are yearly becoming more alive to the importance of better blood and more careful breeding, and in view of the great demand which has of late years sprung up in England for American beef, and which is a trade likely to continue and expand, your Directors feel that a still greater attention to the improvement of stock cannot be too strongly urged. The Directors offered no premiums for male grade animals, believing that no encouragement should now be given in this direction. Some very fine sheep were shown, of which there were ninety entries, the breeds most valued and having the preference being Leicesters and Costswolds, although Southdowns had some good representatives. Of pigs there were thirty-eight entries.

The exhibition of grain was good, and much larger than any previous year. The samples of fall wheat were very choice, and the barley and peas excellent. The entries of wheat were thirty-six, barley eleven, other grains about thirty. The show of apples was unusually attractive, and contained specimens of some of the finest varieties grown in the county. Some good open air grown grapes were also exhibited. Roots were good and display large; and the show of vegetables was extensive and varied, evidencing that our skilful gardeners pay particular attention to this department of horticulture. Dairy products were fairly represented. In this connection your Directors regret that the anticipated success of cheese factories established in the Riding has not been realized, attributable not so much to unremunerative prices obtained for their product as to lack of hearty support on their first establishment on the part of farmers in their neighbourhood. From this cause expenses were necessarily high in proportion to the quantity of cheese manufactured, rendering it difficult for the proprietors in following seasons to secure the confidence and the patronage which alone could make them profitable and successful. Your Directors hope that the high price for cheese ruling in England since the close of the past season will give a new stimulus to this branch of farming industry, and that the success which has been attained in neighbouring counties will also be yet secured in this. In domestic manufactures the exhibits were highly creditable, and the ladies' department was specially attractive, demonstrating that our wives, daughters and sisters are keeping pace with our advancing civilization in taste, culture and refinement.

In taking a retrospect of the past year, and summarizing information obtained and what has come under their own observation with respect to the results of the harvest, your Directors would report as follows: Fall wheat plump in berry, bright in colour, and would yield an average of twenty-two bushels to the acre. The mild, showery spring was favour-

able to its early growth, and the dry, warm summer to its ripening and safe harvesting. Spring wheat suffered severely from the prolonged drought, and its average would not exceed ten bushels to the acre ; sample poor. There was a large breadth of fall and spring wheat sown. Barley was a good sample, and would average about thirty bushels. This cereal is receiving more attention from our farmers, and now that a ready market is within the reach of a large section of the Riding since the opening of the Grand Junction to Hastings, we believe that this crop could be cultivated with more profit than spring wheat, and with less liability to failure. Peas were a fair crop, average twenty bushels ; sample good. Oats, good average, about thirty-five bushels to the acre. Rye, an unusually large breadth was sown in the eastern part of the Riding, many seeding down to timothy and clover with it in preference to any other grain ; yield about eighteen bushels. A ready and profitable market was also afforded for this at Hastings. Hay has not been so heavy a crop for many years, the early mild spring and showery weather which then prevailed being remarkably favourable to its growth. It was cut and saved in splendid condition. It would average about one and a half tons to the acre. As the quantity affects the value, $7 per ton is about the average price. Potatoes turned out well, evenly in size, and quality good ; average about sixty bushels. The Early Rose still retains a first place in public estimation ; many new varieties have striven to win favour, but none have yet taken the place of the Rose, although the feeling is gaining ground that another change would be highly desirable. Turnips were fair, the dry weather in August and September being unfavourable to their full development. We are pleased to observe a greater breadth of turnips being yearly sown. We can only excel in stock raising by providing an abundant supply of these or other roots for winter feeding.

Your Directors cannot conclude without referring to the loss sustained by the Riding in the death of James Miller, Esq. As a member of this Society since its first organization, and for many years one of its Directors, he ever took an active part in its affairs ; and to his shrewd judgment, public spirit, enterprize and zeal in promoting every project that would tend to the progress and improvement of agriculture in the county, the success of the Society is in no small measure due. His blunt honesty in the expression of his opinions, his strict integrity, and genial, kindly manner, will be long remembered by us.

PETERBOROUGH, WEST.

Central Exhibition.

The President's Address.—(James Campbell, Esq.)

Gentlemen,—Since this Association was first organized, five years have passed away —five annual exhibitions have been held under its auspices, and the second round of our annual gatherings has been successfully entered upon. As was to be expected, experience soon made it apparent that the financial basis upon which the Association was first organized would have to undergo considerable change so soon as the first circle of exhibitions had been completed, in order to retain that public sympathy and support by which alone the Association can continue to exist, and to this end at our last annual meeting a new basis was adopted which, although somewhat imperfectly framed, has, I am glad to say, worked satisfactorily during the past year, and gives promise of fairly meeting the circumstances under which our Association exists.

The system then adopted of making each year, or exhibition, stand upon a financial basis of its own, and also throwing the chief financial responsibility, as well as management, upon the members of the executive residing in the locality of the exhibition for the year, has proved highly satisfactory in Peterborough, and I have not the slightest doubt but that it will prove equally satisfactory elsewhere, and be productive of that economy of management by which, as an Association, we can alone hope to retain the support and sympathy of the public. Believing that experience is our best teacher in the management of such exhibitions, as it is indeed in most things, permit me to direct your attention to a

few facts and figures in connection with our operations during the past five years. Necessity compelled a considerable reduction in the amount of prizes offered last year as compared with the amount offered in the three preceding years, and the result, I venture to think, goes to prove that the amount and value of the individual prizes offered does not affect the revenue to the extent that might be supposed. By reference to the auditors' report for the several years I find that the

Prizes paid in 1875 was	$1,786 25
And gate receipts	2,186 82
Showing a surplus of	$400 57
Prizes paid in 1876	$2,526 75
Gate receipts	2,267 69
Showing a deficiency of	$259 06
Prizes paid in 1877	$2,543 25
Gate receipts	2,964 39
Showing a surplus of	$421 14
Prizes paid in 1878	$2,638 75
Gate receipts	2,252 80
Showing a deficiency of	$385 95
Prizes paid in 1879 (including services of Band)	$1,773 25
Gate receipts	2,237 92
Showing a surplus of	$464 67

Now, with the exception of the exhibition held at Lindsay in 1877, it will be noticed that the money taken at the gates has not varied $100, while the amount of prizes actually paid has varied over $900. Of course, the variations which have taken place in the amount paid for prizes is partly attributable to the fact that at both Port Hope and Cobourg those offered for live stock were much more largely taken up there than at either Lindsay or Peterborough, and I cannot help suggesting that the propriety of doing away with the third prizes for all live stock except horses, is worthy of the serious consideration of the incoming executive—the more particularly as the animals receiving the third prize are generally of an inferior quality. But after making due allowance in this respect for the larger amount paid one place than another, I incline to the opinion that the prize lists issued at both the first and last exhibitions at Peterborough were more in accordance with the means and requirements of the Association than the more liberal scale adopted at the other exhibitions, and the point to which I deem it my duty to direct attention is the cost of management. Owing to the manner in which the accounts were kept for the Exhibition of 1875, it would be somewhat difficult to draw what might be considered a just comparison between the expenditure on that occasion and that of succeeding years. I therefore omit it and take that of the last four years, including therein everything except the expenditure for prizes, and the special expenditure of $190 for turn-stiles in 1876, and the payment for the band last year, which I have already added to the prize account for 1879, because in previous years music had been obtained by means of a band competition, and the following is the result:—

In 1876 this expenditure was	$1,163 90
" 1877 " "	1,133 62
" 1878 " "	1,114 61
" 1879 " "	851 15

These figures prove that, contrary to the usual course of such expenditures, ours during the first three years named, showed a steady if not great decrease, and that last year our working expenses decreased nearly twenty-five per cent. on that of the preceding year, a result which, I believe, is largely attributable to the basis adopted last year.

In bidding you farewell, I desire to express the hope that this Association has many years of usefulness and prosperity before it. During its brief career of five years it has, without any direct Government assistance, distributed no less than $11,268 in the way of prize money; it has been the means of bringing the prominent workers in our Agricultural Societies in seven out of eight electoral Ridings, of which this district is composed, together in the great work of promoting our agricultural and manufacturing prosperity, and although the time at these hurried meetings is far too short to afford an opportunity for that discussion and rubbing of ideas together which is always so beneficial, I believe that so long as this Association exists, it will continue to exercise a beneficial effect upon the many interests common to the old Newcastle district; and that none of those who took part in the inauguration will soon have occasion to be ashamed of their child. Certainly not so long as the same disinterested management guides its course in the future as has in the past. * * *

Mr. Wilmott addressed those present with reference to the position of the Agricultural Association, and deprecated the attempts now being made to do away with it altogether, and divide the grant now given to it among the central exhibitions. He hoped they would pass a resolution calling upon the Government to maintain the Provincial Board in its present state. He said great complaints had been made against the expenses of the Board, but even this year the number of members had been increased, and thereby the expenses would be proportionately increased in spite of the Board.

Mr. Lapp and Dr. Ceasar supported the views of Mr. Wilmott.

Mr. Foott said from the position occupied by him as a candidate for the Board, he might say that he had a warm side to the old institution. He did not advocate the division of the annual grant among the central exhibitions of the country. He thought much more good would be obtained by keeping the grant together, and as to the losses sustained this year, it had always lost money when it holds its exhibitions in the east. He thought the farmers should be jealous of giving their honours to others than themselves. They were allowing themselves to be crowded out.

Mr. Lapp said they had nobody but themselves to blame, because they had the matter in their own hands.

Moved by Mr. Carnegie, seconded by Mr. Porter,—That the thanks of this Association be given to Mr. Wilmott for the manner in which he has discharged the duties of representative of this Division on the Board of Agriculture, and that they endorse the action of the Board in presenting him with a gold medal on the occasion of his retirement.—Carried unanimously.

Mr. Wilmott returned thanks.

Moved by Mr. Foott, seconded by Col. Deacon,—That in the opinion of this meeting the Board of Agriculture should be maintained as a representative body of the agricultural interests of this Province, and that a copy of this resolution be forwarded to the Commissioner of Agriculture.—Carried.

PRESCOTT.

Your Directors submit, for the consideration of the meeting, the following facts, and expect that the facts produced will meet with due consideration, viz.:—

1st. That the Annual Show was on average as good, if not better, than on former occasions.

2nd. That the entrance fee at the gate having been reduced from twenty-five cents to fifteen, realized very little less than at the former figure.

3rd. That it is very well known that a mortgage exists (and will fall due on the 18th of September next) upon the Agricultural Grounds for the sum of $540, for which provision to pay must be made, inasmuch that the past year Mr. Butterfield's bill for collecting

the interest due was some $20, but that gentleman kindly made a present of his bill of costs to the Society. However, the Society cannot expect a repetition of the same. And your Directors would advise their successors in office to take warning, while it is time, and make arrangements to pay the said mortgage when due, otherwise they may fall into other hands than Mr. Butterfield's, that may not be so generous in the matter.

Your Directors would call attention to the state of the Agricultural Hall; at present the windows are devoid of glass, even the cupola on top of the building; the void has been made evidently by stones thrown by boys, or perhaps men devoid of common sense; be that as it may, the damage has been done, and there is no trace of the parties that have committed the deed. In the opinion of your Directors there is only one remedy: repair the windows and the cupola, and place blinds upon the whole, so as to guard against such accidents in the future.

In conclusion, your Directors note with gratification a steady improvement, and an increasing interest in agricultural pursuits in the county, as shown by the better cultivation of the soil, improved buildings and farm machinery, an increase in the number of cheese factories—of which there are now some seven or more in the county—together with two creameries which have been in operation during the past season, besides a very sensible improvement in the dairy-made butter, many farmers having availed themselves of the various inventions for increasing the quality and quantity of their dairy products. There is also more interest shown in obtaining pure-bred stock for breeding purposes, which, bearing in mind the opening up of trade in cattle with the mother country, is likely to continue. Your Directors cannot close without expressing gratitude to the Giver of all good for the bountiful harvest of the past year, trusting hopefully for a continuation of the same in time to come.

PRINCE EDWARD.

The Officers and Directors of the Prince Edward County Agricultural Society beg leave to present the following Annual Report, which with the financial statements exhibited to you, will give, we think, sufficient information respecting the proceedings of the Society during the year 1879, and will also show the financial standing of the said Society.

During the past year your Directors have spared no time, or exertions, in order to raise funds for the Society, and thereby improve its finances, and your Directors can congratulate the Society on the result of the Annual Show, which was equal, if not superior, to any formerly held.

The prizes awarded were of a very fair average nature, and the exhibits were many and of good quality, there being considerably more given for premiums in 1879 than in 1878. * * *

RENFREW, NORTH.

Pembroke, Stafla and Alice.

The Directors appointed by you at the last annual meeting of the Society beg leave to report as follows:—

That since the date of said annual meeting the necessary statutory provision has been complied with, authorizing the Society to execute a mortgage of its land for the balance of the purchase money thereof, and the Directors have thus been enabled to obtain a clear deed of the lot. The owners of the private road on which the land abuts, have also executed a conveyance of right of way over said road for all ordinary purposes of the Society.

The Directors have, by surmounting very considerable difficulties, succeeded in erecting a fine exhibition building on the Society's grounds, at a cost of $1,063.11, of which the sum of $648.25 has been fully satisfied and discharged, leaving a balance still due and owing of $414.86. It must necessarily prove very gratifying to the Society generally, as it is to the Directors, that so large, eligible and costly an edifice has been brought to suc-

cessful completion with the contraction of so comparatively small a debt. The Directors cannot, however, refrain from stating that the task assigned them during the past year would have been rendered much less burdensome, from a financial point of view, if the list of members had been increased in the various townships comprised within the limits of the Society, to the extent that was confidently looked for. It is to be hoped that the incoming Directorate will not have a similar complaint to urge when the next report is presented. As will be seen by the Treasurer's statement the interest on the Society's mortgage has also been promptly paid, as well as the whole amount of prizes awarded, with the exception of some six dollars not yet called for.

The Society's Second Annual Exhibition was held in the new buildings on Wednesday and Thursday, the 8th and 9th days of October last, and proved eminently successful in every respect. * * *

The Society also held a Ploughing Match in conjunction with the Electoral District Society, on the 21st day of October last, with satisfactory results. Through the kindness of certain manufacturers the Directors were enabled to offer three handsome first prizes as the Society's contribution to the joint list of premiums. * * *

On the whole the Directors have great pleasure in reporting a most satisfactory condition of affairs, with every prospect of increased prosperity during the coming season.

RENFREW, SOUTH.

McNab.

In presenting to you our report of the proceedings of the past year, your Directors beg to congratulate you on the bountiful harvest which has rewarded your labours, especially in view of the present destitution prevalent throughout the continent of Europe.

The cognate interest of lumber also appears to have revived to provide an increased circulation of money as well as a good market for our surplus agricultural productions. Whilst Providence thus blesses our efforts any disadvantages under which we labour must to a great extent be those of our own creation. Every good citizen therefore should prefer the sunshine of a friendly and honourable rivalry in the arts of peace and industry, which benefits every competitor, and which has always been rewarded with the richest blessings, to the storm of a divided community sometimes encountered on other public occasions. To direct our labours intelligently and profitably in this noble contest, and accomplish the greatest good, your Directors believe that such a lecturer as W. F. Clarke, Esq., should be employed for a sufficient time and paid by the united action of all the societies in the county; that the *Farmer's Advocate* be generally got and read, and that a prize be awarded for the best original essay on some important agricultural subject. * * *

The exhibition was successful as usual, and highly creditable to the members. Many of the exhibits might have adorned the Provincial Exhibition. A ploughing match was held on the farm of James McCreay, Esq., who highly deserves the thanks of the Society for his hospitality on that occasion. The work done was excellent and the competition keen. The committee could not find a more accessible field, and your Directors therefore recommend a more general use of the stumper.

SIMCOE, EAST.

Last year your Directors were enabled to state that the prosperity which for a number of years had attended the progress of the East Simcoe Agricultural Society was still on the increase, and we are again able to state that during the year 1879, it has not been less successful than formerly, as regards the number of its members and the attractiveness of its exhibitions. The success of this year's Exhibition has imparted a new life and impetus

which it is hoped will tell effectively in reviving a more extensive interest and support in its welfare, both in town and surrounding neighbourhood. The good impression made upon the public, by the Press and other influences, at the time of our Spring and Fall Exhibitions, has encouraged the Directors to hope that a larger portion of the farming community will enter the ranks of the Society during the year. Heretofore too little interest has been manifested by the farming community in the welfare of the Society. This state of affairs ought not to exist, and which it is hoped ere long will be changed to a large increase in the number of its members from the agricultural classes, who are chiefly interested and benefited by the prosperity of the Society.

Your Directors, therefore, would urge upon their successors, as well as upon the members of the Society, the necessity of increasing the membership. The welfare of the Society depends mainly upon the numbers of those who take sufficient interest in the prosperity of the Society, by uniting themselves to it with a higher purpose than that of drawing prize-money.

The year 1879 has been an extraordinary season, and the farmers have every reason to be thankful for an abundant harvest and for the blessings of peace and plenty.

The Spring Show of stallions and bulls, on the 24th May, was a decided success.

The Annual Exhibition was held on the 30th September and 1st October, and was in the number of entries, and value of the animals, and the articles displayed in the various departments, one of the most successful shows held by the Society, the receipts amounting to $275, being an increase of $70 over previous years. The total number of entries was 1,366, against 1,600 for 1878, and the competition in all the classes was very keen, particularly in live stock and grain. The exhibit of root crops and fruit was not so excellent as heretofore, owing, in a great measure, to the damage sustained by the hailstorm in the month of August. The dairy department was equal to former years, and the number of entries exceeded those of much older and larger localities. A marked improvement was noticeable in the specimens of cheese exhibited, and it is to be hoped that our farmers will leave no stone unturned to bring this profitable branch of the dairy department to perfection. The show of potatoes was very fine, although not so large in size as in former years; the varieties, however, were more numerous and of a better quality; the rot was apparent in many of the specimens of Early and Late Rose. In the domestic manufactures and ladies' work department a falling-off was observable in many articles, owing, no doubt, to the rule excluding all articles that had hitherto taken a prize at any show; your Directors would suggest the abolition of this rule on future occasions, and the enlargement of the ladies' work department, in fact, they advise the readjustment of this class altogether, and the publishing of the readjustment as soon as possible, in order that the ladies may have ample time to prepare work for the next Annual Show. The show of poultry was not so large as last year, but there was a marked improvement in the breed of those that were shown. Your Directors regret that more attention is not paid by the farming community to the raising of good breeds of poultry; it is no more trouble or expense to raise well-bred fowls than common breeds, and we are sure the farmers will find it to their interest to devote a little more attention to this branch of their business. The display of waggons, carriages and agricultural implements was very fine, the entries being more numerous than on former occasions, and of a much better class.

In the selection of judges, your Directors, after due consideration, determined to apply to the directors of sister societies for judges on horses, cattle, sheep and swine. Their application was cheerfully complied with, and so far as we know their decisions have given satisfaction. * * * *

You will observe by the financial report of the Secretary-Treasurer, which we now beg to submit, that the affairs of the Society are in a flourishing condition, and although the balance is on the debit side of the cash-book—$26.91,—there is every reason to believe that next year will close with a good credit balance, as there are many expenditures this year that will not occur again. Total receipts last year, $1,615; for 1879, $1,896; being an increase from all sources of $281.

The reports from the Branch Societies have been received and are very satisfactory, with the exception of Medonte, whose prize-list is $25 less than the amount received from the Society, although they show a membership of sixty-eight.

Before closing their report, your Directors desire to express their gratitude for the handsome subscriptions received from the merchants and other friends in the town of Orillia, and for the hearty co-operation extended them during the past year; and they beg respectfully to suggest to the new Board the desirability of communicating with the West and South Simcoe Societies, with the view to petitioning the County Council for a grant of $1,000, to be equally divided between the Electoral District Societies.

Tiny and Tay.

(Report of the Secretary.)

I have the honour to transmit the Annual Report of the Tiny and Tay Agricultural Society for the year 1879.

I am happy to say that we have prospered financially during the past year. The exhibit of live stock at our annual Fall Show was not greater, as regards number, than at the show of the preceding year, but there was a great improvement as regards quality. The display in the roots, grain and ladies' work was excellent for a township show. In regard to crops in this vicinity, fall wheat, peas and hay were very good; oats were below the average; while spring wheat was very poor.

The state of agriculture in the two townships is improving. A good portion of Tiny and Tay was settled by French habitants, whose system of agriculture was very primitive indeed; but a large portion of them became heavily mortgaged, and were obliged to sell and remove to Manitoba and Minnesota; their place was taken by enterprising and intelligent farmers, and owing to this and to the fact that two railroads, whose termini are situated in each of the two respective townships, have been open for traffic during the past year, I may safely say that we have entered on a new era of progress.

As a manufacturing community, I am rather afraid I cannot say much in regard to it, unless I enumerate two or three large saw-mills. There is a large glass factory in course of erection in the village of Penetanguishene for the manufacture of window glass (the only one, I believe, in Canada). The sand has been satisfactorily tested. The manager calculates that it will give employment to about two hundred hands, which, if true, will give an impetus to the home market for provisions, etc.

SIMCOE, WEST.

Your Directors, in submitting their Annual Report, have to regret that the interest felt in the success and prosperity of the Society, as manifested by membership and attendance at the Annual Show, is not as great as should be, considering the extent, population and advantages of the county; nevertheless, they have much satisfaction in noticing that each succeeding exhibition indicates a marked improvement in the number and quality of thoroughbred cattle, from which assurance is gathered that the farmers are turning their attention in a direction much called for in this county, particularly when we keep in view the great and increasing demand for exportation of cattle to the old country, now fast becoming the market for our surplus stock.

It is much to be deplored that the same satisfactory remarks cannot be applied to the exhibit of either draught or carriage horses, since a similar market is rapidly developing in that direction, and it is to be hoped this demand will stimulate the farmers to give their attention to the improvement of the breed of horses.

The account shows that upwards of $800 have been expended in prize money, and of this the people of Barrie contributed upwards of $350 in special prizes, for which the thanks of this Society are due.

While during the Exhibition the weather was most favourable and the attendance very good, considering that the South Riding Show was held at the same time—a matter much to be regretted and in the future to be avoided, if possible—your Directors feel called upon to notice the entire want of interest in the mechanical and manufacturing de-

partments of the Exhibition, and beg to submit that greater interest would be aroused in this respect if, instead of diplomas being awarded, a sum of money was paid in prizes.

Your Directors will have to fix on the place for holding the Annual Show for this year, and, while having this under discussion, it might be advisable to consider the propriety of coming, if possible, to some arrangement with the other two Electoral District Societies for the county, whereby the three societies would join together and hold their annual exhibitions in rotation, thereby making them much more attractive and useful for the purposes for which they are organized. * * *

Vespra.

The Annual Exhibition of the Society was decidedly successful, and was attended by a larger number of visitors than usual.

The township of Vespra has long been noted for its superior stock. Owing to poor pasture the cattle exhibited were not so well up in flesh as their owners would have liked to see them; still, a finer lot of cattle, sheep and pigs could hardly have been found within the county. The same cannot be said of the horses exhibited, although a large number of useful animals were on the grounds. The hall was too small to show to advantage the fine specimens of roots, vegetables, fruit, etc., exhibited, which deservedly elicited the admiration of visitors. The show of grain was larger than usual, very fine samples of fall and spring wheat, as well as of coarser grain, were exhibited. The exhibits of dairy produce and domestic manufactures were fully up to previous years. In the ladies' department there was a meagreness in the quantity of articles shown, owing likely to a very restricted prize-list in this class.

Your Directors have much pleasure in reporting that a Fall Ploughing Match was held in connection with your Society. Through the liberality of outsiders, your Directors were enabled to offer very handsome prizes to three classes of ploughmen, which, notwithstanding the unfavourable weather, were keenly contested in the presence of a larger number of visitors than under the circumstances could have been expected to be present. The work made was very creditable to the ploughmen. Your Directors trust that the Vespra Ploughing Match will become as permanent as the Fall Show.

It is very gratifying to your Directors to report that the finances of the Society are in a satisfactory condition. Subscriptions and Government grant have increased during the year. Your Treasurer, after paying all demands, will have a good balance in hand. The Treasurer's balance-sheet will be laid before you.

In conclusion, your Directors are sure you will join them in expressing heartfelt thankfulness to the Giver of all good for the abundant harvest, and the fine weather to gather it, with which Vespra, along with the rest of Canada, was blessed the past year.

SIMCOE, SOUTH.

Your Directorate, in making this the Twenty-second Annual Report of your Society, are pleased, notwithstanding the hardness of the times and the scarcity of money, to be able to congratulate you on its continued sound financial standing. Your Directorate are also pleased to be able to congratulate you on the bright dawning of more prosperous times; for although your spring wheat was nearly a failure, yet your heavy crops of fall wheat and other cereals—the abundant crops of hay, roots and vegetables, and the good prices attainable—must in a great measure relieve the depression of the past few years and restore public confidence.

During the past year your Directorate held but one exhibition. The annual Fall Exhibition of your Society was held in the Agricultural Park, Cookstown, on the 2nd and 3rd days of October last, and although several shows came in contact with it, yet we are proud to say it was one of the best ever held in the county. The number of entries and the amount collected at the gates were fully equal to the average of former years.

The stock exhibited were far superior to any hitherto shown. The thoroughbred Durham cattle, horses of all classes—particularly the draught and general-purpose classes,—and the Cotswold and Leicester sheep were far in advance of any before exhibited at your Fall Shows, and it is a matter of congratulation, for, if we only look back a few years, it was quite a rarity to see a thoroughbred Durham beast or pure Cotswold or Leicester sheep, and now some farmers exhibit whole herds of thoroughbred Durhams and pens of pure-bred Cotswolds and Leicesters. The show of grain and other cereals, roots and vegetables was not only large, but the samples really splendid; nor was the display of agricultural implements less marked for substantial make and artistic design, proving that the manufacturers are keeping pace with the advancement of the age, thanks to the Government's fostering care. And your Directorate are pleased to be able to congratulate the ladies on their department, which was fully equal to former years, and had they been backed up by the merchants and artisans of the village, as they were in other parts of the county, by the exhibition of their fine cloths and fancy wares, their department would not have been excelled by any other of the kind in the county.

In conclusion, your Directorate, however, regret to say that in no year of the past has your Society been so poorly patronized in the sale of tickets of membership, and unless a more liberal spirit is manifested in the future, your Society will not be able to sustain her enviable financial position. And as they now resign to you their trust, they would most respectfully solicit for their successors a more liberal and warm-hearted patronage: for you must recollect, gentlemen, that it is upon your efforts in the development of agriculture that the prosperity of your country depends—prince and peasant have alike to look to you for support.

STORMONT.

This Society is in a more prosperous and better financial position than at any time heretofore. The general interests of the farming community are also prospering in a moderate way. Our crops, on the whole, were abundant and have suffered much less damage than we had reason to fear. The low price paid for farm stock and produce for the last few years has had a depressing effect upon this branch of farming, yet we think that the dawn of a better day is come. Experiments have proved that our surplus of farm stock and produce can be shipped to Britain, and find ready sale in the populous cities of that busy island, at prices that will surely encourage and develop this important branch of our interest.

Your Directors, on taking office, found a balance on hand of $121.19, and paid $96.50 more in prizes this year than last, and still have a balance in hand of $183.07.

The Annual Fair was held on the 18th and 19th September, and was a success, considering the difficulty of getting all classes to unite cordially together. The number of entries was about 1,200; the number of members, 165. The total receipts from all sources was $1,156.39. Expenditure, including grants to township agricultural societies, was $973.32. The display of stock of all kinds was large and a few good animals exhibited, but there is much room for improvement. The mechanical department was much better than last year. There was a good show of labour-saving machinery, ploughs, harrows, cultivators, etc., also some double and single carriages. The appearance of the hall, taken as a whole, was equal to anything hitherto seen in this Division. The quantity and variety of all kinds were so great that there was considerable difficulty in finding room for all that was brought forward. The display of grain and roots was excellent, showing that the agricultural resources of the district are of no mean order. The display made by the ladies was really creditable. Your Directors would here suggest to their successors that a more varied list and better premiums be awarded the ladies' department in future. It is a fact that a majority of the paying visitors go purposely to see the ladies' work, giving the outside show a mere casual notice.

TORONTO E. D.

Your Directors beg to submit the following report of their transactions during the past year:—

During the latter portion of the preceding year, as you will have seen by the last Annual Report, the Directors of this Society met with the Exhibition Committee of the City Council to discuss the question of holding an Annual Industrial Exhibition, for the encouragement of agriculture, horticulture, arts and manufactures, in the City of Toronto. After a number of meetings, at which representatives from other organizations were present, a scheme was devised for establishing an Exhibition of the character referred to. Agreeably with the action taken by their predecessors, your Directors gave the matter full consideration and heartily sustained the project.

In view, therefore, of the immense efforts required to make this, the first Exhibition, a complete success, your Directors deemed it desirable to drop the Society's usual Spring Horticultural Exhibition; and, in accordance with the permissive clause of the Act, to give a grant of money to the Industrial Association. They feared that in carrying out the Spring Show their time would be so taken up, and the different interests so divided, that it might seriously affect the successful carrying out of the larger scheme.

That this Society's usefulness was not diminished by its co-operation with the Industrial Association, and that it has accomplished quite as much if not more than in former years, your Directors think has been shown by the success of the Industrial Exhibition, or, as it has been termed by the press, "Canada's Great Fair." Apart from the prominence lent to it by the visit of His Excellency the Governor-General and Her Royal Highness the Princess Louise, the Exhibition was undoubtedly by far the largest and best that has ever been held in the Dominion, and has given promise of even greater magnitude and success in the future. As the Association's Exhibition will doubtless be fully reported upon by its Directors, it will be unnecessary further to refer to it here. Your Directors would therefore beg to suggest to their successors in office—now that the permanency and success of the Industrial Exhibition is assured, and that its Directors will not be so much pushed as they necessarily were in their first Exhibition—that efforts be made to hold a Spring Horticultural Exhibition in some suitable and conveniently located building—say the pavilion in the Horticultural Gardens.

The difficulty in bringing the different classes of florists and horticulturists into competition, and also the want of a suitable building, has heretofore been very much against your Society; but the erection of the new pavilion at the Gardens, and the promise of a more liberal and diversified prize list, will doubtless obviate this difficulty; and there should next year be carried out the largest and most successful Horticultural Spring Exhibition that has yet been given in the City of Toronto.

The Treasurer's statement shows total receipts for the year from all sources—including a balance in hand of $196.45 from the preceding year—to have been $955.45; and the expenditure $694.58; leaving a balance in hand of $260.87.

In conclusion, your Directors regret to have to record the lamented and somewhat sudden death, on the 23rd day of March last, of your late President, Philip Armstrong, Esquire, who had been connected with this Society from its organization, repeatedly holding the positions of Director and Vice-President, and for a number of years that of President. He was at all times one of the most energetic promoters of the interests of this Society, and by his death it has sustained a great loss. Our deceased colleague and friend will long occupy a foremost place in the memory of his fellow citizens.

VICTORIA, NORTH.

Your Directors in submitting the twelfth Annual Report of the Society, have much pleasure in being able to state that the heavy and wide-spread depression under which

we, in common with others, have suffered during the past few years, has given place to the golden dawn of what we would hope will prove to be a long period of prosperity.

The crops during the past year, although not up to what was at one time anticipated, were, nevertheless, much more abundant than during the past two years, and better prices realized.

We have also to report with unfeigned gratitude the absence of any fatal diseases among live stock in the Riding—of such diseases as in other countries assumed the proportions of a national calamity.

We beg leave to report that, owing to the want of sufficient hotel accommodation at Glenarm, the consequent dissatisfaction among exhibitors, and the loudly expressed desire of many of them for a change, in the place of holding our Fall Shows, your Directors—at least a majority of them—thought it desirable to submit to you, the members of two years' standing in the Society, the advisability of holding the Fall Show at Victoria Road Station instead of at Glenarm as formerly. A public special meeting for this purpose was duly called, as by law required, on the 8th day of July last, when it was unanimously resolved that the next Fall Show be held at Victoria Road Station.

This disturbance of long established affairs, the dissatisfaction thereby felt by many of our best exhibitors in the south of Eldon and Fenelon, and the unsuitable nature of the gound selected, operated to a very large extent against the success of the Show, insomuch that the number of entries fell considerably below that of the previous year, and less money was realized at the gates.

Your Directors are also pleased to report that the union ploughing match held last fall in the township of Eldon, near Woodville, under the auspices of this and the South Riding Societies, was an unqualified success.

We have also much pleasure in acknowledging the sum of $200 from the County Council, and the sum of $20 from Hector Cameron, Esq., M.P., to whom this Society owes a debt of gratitude for their liberal donations annually conferred upon the Society.

VICTORIA, SOUTH.

Your Directors in delivering up the trust which you reposed in them at your last annual meeting, beg leave to thank you for the honour conferred on them by your confidence, and doing so, beg leave most respectfully to report :

That they have been unable to dispose of the property purchased prior to the acquirement of the present Agricultural Park in the town of Lindsay, the possession of which and the payment of interest on the purchase money has been very embarrassing to the funds of your Society, but they venture to express a hope that the advent of more prosperous times will enable the Society to dispose of the property without any loss.

In accordance with the custom of the past, two exhibitions were held during the past year. The spring exhibition may be considered on the whole a success, but owing to the state of the roads, and distance of the Park from the centre of business, there was a falling off of some $20 in the admission fees. The exhibit of horses was unusually good, but your Directors without in any way animadverting on the public spirit of the farming community, cannot but express a regret that the exhibit of horned cattle was by no means equal to that which might very naturally be expected in a Riding possessing such agricultural facilities and variety of soil as that possessed by South Victoria, and they venture to express a hope that their successors will hold out such inducements during the present year as will materially promote the exhibit of better stock, the more particularly so as cattle raising has become an important element of success in Canada generally.

The Fall Exhibition was, all things considered, a success, when it is taken into account that our Exhibition followed closely on that of Toronto, and the Provincial at Ottawa, the Central at Peterborough, and concurrent with the neighbouring societies of the County. It gratifies your Directors to report that there was an increase of some 600 entries and about $12 admission fees over the year 1878.

Your membership now shows 213 paying subscribers, an increase of 29 over 1878, while prizes amounting to $500 were paid to exhibitors. Your finance report will show about $280 on hand, which will be absorbed by payment of interest becoming due during the year.

Your Directors beg to suggest that every effort possible be made to obtain a larger number of members; that greater inducements in promoting a superior exhibit of horned cattle, and by courting the friendly co-operation of sister societies they confidently hope that 1880 may be a successful year for the Society generally.

In conclusion, your Directors beg to express their approval of the new financial basis upon which the Central Exhibitions of the Fifth Agricultural District is now held.

Emily.

The Directors of the Emily Branch Agricultural Society in presenting the Annual Report of their operations for the past year beg to congratulate the members on the continued success of the Society.

Our membership has somewhat decreased from that of the previous year, but considering the stringency of the times our position may be considered respectable.

The Directors considered that it was unwise to have a Spring Show last year: they accordingly dispensed with it. Our Fall Show was an unprecedented success. The quality of the articles exhibited reflects credit upon the people of both the Township of Emily and the Village of Omemee.

Our share of the Legislative grant was $121.90.

The receipts from all sources, together with the balance from previous year, were $283.33, and the expenditure was $272.79, leaving a balance in hand of $10.54.

We have again to deplore the small yield of spring wheat, which averaged not more than ten bushels to the acre in this section of country; but this has been compensated in some degree by the very good price which has obtained during this fall and winter. Fall wheat, however, was an excellent yield; it averaged fully 30 bushels to the acre. In some cases the yield was as much as 50 bushels. We note that a most extraordinary amount of fall wheat was sown last fall. If the result at all comes near the farmers' wishes it will go far to dispel the cloud of gloom which has rested on them these last two or three years. Coarse grains, such as barley, oats, etc., were an excellent crop. Barley averaged 40 bushels, oats 45 bushels, potatoes 200 bush., peas 25 bush., roots a good average, whilst the yield of hay was almost unprecedented. * * *

Ops.

Your Directors beg to report that at the beginning of the year there was a debt of about $25. This has now been reduced to $4, the assets and liabilities of the Society being as follows:—Assets: Amount due the Society from Mr. Peter Fisher, $12. Liabilities: Balance of note held by Mr. Spier, $10; salary of Secretary-Treasurer, $5; printing, $1; total, $16.

It was hoped that by amalgamating with the County Society and assisting in the carrying out of the Spring and Fall Shows, additional life and energy might have been attained, but this object was unfortunately departed from, and as on former occasions the service of thoroughbred stock has been attended with loss.

The number of subscribers was thirty-one, and the grant was correspondingly small, namely, $37.42.

The question of carrying on the Society under the present depressing circumstances will be for the consideration of the members.

All of which is respectfully submitted.

WATERLOO, NORTH.

Your Directors beg leave to report that our last Show, held on the 7th and 8th days of October last, was, despite the threatening weather on the morning of the second day of

the Show, a grand success, both financially and otherwise, and in every particular superior to any Show previously held in this Electoral Division. We may also state, for the information of the members of the Society, that since the two days system has been adopted for holding the Shows our Society has been on the gradual increase from year to year, more so than any Electoral Division Society in the Province. According to the official Agricultural Reports of the Province, the great majority of Electoral Division Societies have, since the adoption of central exhibitions in various parts of the Province, gradually decreased both financially and in numbers of entries, when ours has been on the increase.

We also take great pleasure in congratulating the Society on the marked improvement both in quantity and quality, of all kinds of stock exhibited at our last Show, and may also say that in the the various classes, such as roots, fruits, grain, dairy produce, agricultural implements, domestic manufactures, fine arts and ladies' work, the exhibit was about an average. Except in the exhibit of fruit, its display would have compared favourably with most of the central fairs.

We have caused the accounts of the Treasurer to be audited according to law, and the Auditors report a balance of $320.38 in the Treasurer's hands to be carried forward to the year 1880.

We recommend the incoming Directors to put forth every possible effort to make the next Show a success, for we have every reason to believe that by a united effort on the part of the Directors, assisted by the members of the Society, we will cultivate a feeling of union between North and South Waterloo, and if those two Societies can be united into one we have no hesitation in stating that we would then have a Show that would equal the central fairs.

WATERLOO, SOUTH.

Preston Horticultural Society.

The Board of Directors herewith present to the members of this Society at their second annual meeting a report of the proceedings during the second year of the Society's existence.

The statement of the receipts and expenditures of the Society have been prepared according to statute, and are hereby submitted for your inspection, and we trust will be found satisfactory.

Notwithstanding the scarcity of fruit, flowers and vegetables in this place and neighbourhood, caused by the want of rain during a part of last summer, the Exhibition upon the whole was satisfactory, the entries were more numerous, the amount of prize money paid was larger, and the expenses were considerably less this year than during the first year; the latter owing to various items of expenditure connected with the foundation of the Society.

During the first year the exhibits were almost exclusively confined to the inhabitants of Preston, but during this second year a fair number of exhibitors were from other localities in the county, thus showing that the interest taken in this Society is not confined to the Municipality of Preston and that it has a fair prospect for increased strength and importance.

The beneficial results of having established a Horticultural Society in Preston are already perceptible in the increased cultivation of superior kinds of fruit and vegetables, and in the culture of a greater variety and rarer kinds of plants and flowers.

Great credit is due to the several musical bands in Preston for having volunteered to enliven with their excellent music, the evenings of the Exhibition; and to these gentlemen the thanks of the members are due for having materially contributed to the success of our evening exhibitions.

Though we are but a young Society with only a small fund in the treasury, yet it is not too soon at least to calculate upon and to endeavour to raise a fund which will be sufficient to enable us to erect a Horticultural Hall which will be both an ornament and a

benefit to Preston, and we feel confident that by proper and judicious management that aim will be attained at no distant day.

We hope, gentlemen, that those whom you elect as office-bearers for the ensuing year will use their utmost endeavour to forward the interest of this Society, and that we will all unite in making it a grand success.

WELLAND.

Your Directors in submitting their Annual Report of the Board of Directors of this Society, beg leave to report that they are warranted in stating that it has been the most prosperous year recorded in the annals of this Society.

The Fall Show far exceeded any ever held under the auspices of this Society, which statement holds good in the various aspects in which it may be presented, for the attainment of which end several factors largely contributed, especially those of weather and roads—the former being beautiful and warm, and the latter were all the most fastidious could desire. The attendance on the Fall Show is computed to have been some 6,000 persons, all apparently well delighted with the Exhibition and its arrangements, testifying thereby, to the Board of Management in their endeavours to have all things properly arranged, their appreciation of their services.

The number of animals and articles registered for exhibition this year far exceeded that of any antecedent period, the number recorded last year being 930, this year 1,761, showing an increase of 831. The amount of fees received at the gate this year attained to $574, that of last year $433, showing an increase in favour of this year of $141, which proved a source of gratification to your Directors.

The horse department was well filled, every prize being taken up, three alone excepted. They appeared in good condition, and as usual proved the most attractive feature of the Show.

The Durhams exhibited were fine indeed, and elicited warm commendation which must have been gratifying to their respective owners, and particularly to Messrs. Crawford, and H. & I. Breeden, who were the principal exhibitors in this class. The grade list contained many excellent animals, Mr. Brown excelling in that class as usual.

The sheep as usual were very numerous and in grand condition ; all prizes in this class were awarded. Messrs. Crawford and Swayle carried off the palm in the Cotswolds, Messrs. Jackson, Metler and Upper, in the Leicesters, and as usual Mr. Ash in the Southdowns.

The swine list was better filled than on previous occasions, but there is still room for improvement.

The grain department was well filled, and there were very many fine specimens, particularly in the fall wheat, this season being remarkably well adapted for the maturing of the crops, scarcely any rust being seen in this section of the country. The roots and fruits exhibited were truly excellent, the number of samples and their remarkable size were very imposing, all which should evoke a spirit of devout gratitude to that beneficent Being who so bountifully supplies them all.

There was a decided improvement observable in the ladies' department, which at all times furnishes pleasure to the attentive beholder.

The manufacturing department was well filled, and its interest well represented, both by manufacturers residing in the county and those from beyond, and certainly all evincing an ingenuity in their construction and neatness and polish in their finish, all commendatory of the various firms thus represented, and it would certainly be an invidious task to single out, where all have done so well.

In conclusion, your Directors would hereby tender their sincere thanks to a generous and enlightened public for the substantial aid afforded to the Society ; also to the Welland County Council for their generous donation to the funds of this Society ; also to the Committee of Management for their labours in the interests of the Society.

WELLINGTON CENTRE.

The Directors of the Centre Riding of Wellington Agricultural Society beg leave to submit the following report of its transactions for the year 1879.

The Townships of Nichol and Pilkington Agricultural Societies amalgamated with this Society in 1879, contributing to its funds the sum of $178.40.

The Union Exhibition was held in the village of Elora on the 10th and 11th days of October. The grains, seeds, roots, and ladies' work in the drill shed; and the horses, cattle, sheep, pigs, and implements, on the grounds adjoining thereto.

The sum of $801.50 was offered in prizes, of which $97 fell back to the Society from want of competition. The Show, although not so extensive as in some former years, yet in general excellence was fully up to any of its predecessors.

Your Directors are glad to be able to state that the country has been blessed with a liberal harvest, the best for many years, and that the prices for grain are good, thereby enabling farmers to meet their liabilities promptly, and through them assisting the whole community.

The Treasurer's books have been audited in the manner prescribed by law and found correct; showing a balance to the credit of the Society of $6.99, but as there is still a balance to pay of $45, will leave a debit of $38.01.

The various reports and statements are in the hands of your Treasurer, and the detailed accounts, as required by law, are appended thereto, subject to your inspection.

All of which is respectfully submitted.

WELLINGTON SOUTH.

The Directors of the Society make this their ninth report of the business transacted by the Board during the past year.

The Exhibition took place on the 16th, 17th, 18th, and 19th of September, and on the whole we had a very fair exhibit, although the show of stock was not equal either in quality or number to former years. This is attributed to the Toronto Industrial Exhibition being held on the same week. During last year great efforts were made by the citizens of Toronto to inaugurate what is styled an Industrial Exhibition, to be open for three weeks, from the 1st of September to the 19th, and the stock were to be shown the last week, consequently it conflicted with our Exhibition. This was felt by the Directors to be directly interfering with our rights, as we had for several years held our Show the week previous to the Provincial, of which due notice was given in the fall of 1878. At a meeting of Directors held on 5th July last, it was brought before the Directors, and a Committee was appointed to proceed to Toronto and confer with the Directors of the Industrial Exhibition, with a view of getting them to make some alteration in their programme to prevent the two shows—"more especially the stock department"—from clashing.

The Committee had an interview with those gentlemen, and on the next meeting of the Board, presented the following report:

Your Committee beg leave to report that they proceeded to Toronto on Tuesday, the 15th July, and met the Directors of said Exhibition, and found that between the time the Committee was appointed and their arrival in Toronto, they had issued their bills and prize list. They stated that under those circumstances, they could not make any alterations in the days they had already named for the exhibit of stock. The Committee pressed the matter, taking the ground that as our day had been fixed upon last fall, and duly announced through the press, we thought they had trespassed upon us. They expressed regret at having fixed their days so as to clash with us, but under the circumstances could not alter or change this year.

After mature discussion at the Board, it was resolved to adhere to the original day for holding the Central upon, trusting that as a large percentage of the stock shown at the Provincial and other large shows came from this county, the breeders would be

patriotic enough to patronize their own county rather than exhibit at a rival exhibition which had shown such a disposition to crush out all smaller shows. But we are sorry to say, the larger prizes offered by our rival was too great a temptation to some, thereby causing the falling off in stock as previously alluded to. The evident intention of these gentlemen is to crush out, or cripple, not only any other exhibition that may interfere with them, but also the Provincial, so that in time they can see their way clear to advocate the centralizing the latter permanently in Toronto. This of course remains with the farmers of Ontario to say whether it shall be so or not, and we do not suppose the Legislature would make such a change unless sanctioned by the voice of the agriculturists of the Province. We also see by a circular sent to the Board that Toronto intends holding their show on the 2nd and 3rd weeks of September this year, and the Provincial on the 3rd and 4th weeks, so that the whole of the month of September will be monopolized by these two institutions, to the exclusion of all others. It will, therefore, be the duty of our successors to fix upon some week to hold the next Central in for the coming year.

At a meeting held on the 22nd April, it was decided to invite the Governor-General and Princess Louise to open the Exhibition in September; a committee was appointed to draw out an invitation to that effect and forward it to Ottawa. This was done, and at a subsequent meeting held on the 17th May, a letter accepting the invitation was received from the Governor's Secretary.

A committee was then appointed to confer with the City and County Councils to enlist their co-operation in entertaining their Excellencies on the auspicious occasion. After several meetings with the committees of the above Councils, it was found necessary to agree, on behalf of this Society, to pay one half the expenses of entertaining the august visitors on their arrival in our city. At a subsequent meeting of the County Council that body agreed to pay $400 as its portion of said expense. The Directors felt justified in the course they had taken, looking forward to the large increase they might reasonably expect from the increased attendance on the occasion, and had the weather been propitious there is no doubt that their expectations would have been realized, but owing to the continuous rains from the opening of the Exhibition to its close their hopes were sadly disappointed, and instead of having a surplus, as we had every reason to expect, we have to announce a serious deficit.

In alluding to the visit of the Vice-Regal party to open our Exhibition, we may do so with commendable pride, as it was the only one in the west, with the exception of the one in Toronto, that was so honoured, and we have the satisfaction of knowing that every arrangement was carried out with perfect success, and did credit to our good city and county. A great deal of this success was due to the hearty co-operation of the citizens, and more especially to those chairmen and members of the different committees, who were indefatigable in the work allotted them, and had the weather been propitious we should have been able to look back on the occasion with twofold pleasure.

The Governor-General and Princess expressed themselves as highly pleased with their reception, and also with the Exhibition, taking particular interest in the manufactures and stock.

We would suggest that means be taken to ascertain the views of the breeders in this county as to whether, under the circumstances, they would be willing to exhibit their stock for this one year for honorary prizes. We think that by putting the matter fairly before them, by circular or personal interview by some of the Directors, they might be prevailed upon to do so. By this means and by deducting something from the other portions of the prize list, we feel sure that the debt can be overcome.

Part of the reason why we are so far behind this year is attributable to the fact that the County Council instead of contributing one thousand dollars as they have so liberally done before, cut us down to six hundred, and the specials offered did not amount to as much by $436. These two items alone will account for the deficiency, and taken into account with increased expense incurred in the Vice-Regal reception will show that the Directors have done all that possibly could be done under the circumstances.

In bringing before the members a few features of the late Exhibition, we may say that taking the great rivalry of the Toronto one into account, being held on the same

week, we had a very good display. In the different classes of horses the entries footed up to as many as in 1878, and although some very fine animals were exhibited, as a whole they were not as good as in some former years. This especially may be attributed to the Toronto show, as we have always had a large number of fine horses from that section of the Province.

The exhibit of cattle did not by any means come up to what might be expected in a county like Wellington which is so famous for its good stock; this, no doubt, was caused in some measure by several breeders not exhibiting their stock this year at any show, and others again were induced to show at the rival exhibition, where larger prizes were offered than at the Central.

In sheep the exhibit was much less than in 1878, owing we presume to the same cause, for we miss the names of some of the most successful breeders who have always attended our exhibitions. The same may be said as regards pigs, the show of which was in number far behind the shows of 1877 or 1878.

The show of poultry, although not so large as in former years, was nevertheless a very good one. Most of our old friends patronize us, as they know that strictly impartial justice will be awarded them.

The dairy produce, as usual, was a strong feature, and the beautiful samples of butter and cheese called forth marked expressions of approval from Her Royal Highness the Princess Louise, who was pleased to accept the first prize basket, given by Mr. Ellis, of the American Hotel.

In grain, etc., there was a good display, more being entered than in 1878. The show of fall wheat was extremely good, while spring wheat and barley were also a better sample than for some years past. There was a large falling off in roots (with the exception of potatoes, which were never better), owing to the early season of the year, when turnips, carrots, and mangolds have not attained their full size.

There was a good display of garden vegetables, plants and flowers, and these were very beautifully arranged, setting off that part of the building to great advantage. The show of fruit was something beyond what we have ever seen at any exhibition outside of the Provincial. There were the large number of nearly 1,100 entries in all kinds of fruit. There was keen competition, and the samples were very fine. This may be said more especially of plums, as a finer display could not be collected together in any part of the Dominion. This is no empty boast, as many of the samples were taken from here to the Provincial, and carried off first honours there, not only for single varieties, but for collections, showing that this locality is pre-eminent for plums.

We must again thank our agricultural implement friends for making such a grand display of their manufactures as we had on that occasion, especially when we take into consideration the fact that for nearly all they exhibited no prizes are offered. It would be well if some more of our exhibitors followed so laudable an example and competed more for the honour than for the mere dollars and cents, many simply paying a dollar and taking out a hundred or more. In agricultural implements and tools there was a very fine display, especially that made by J. M. Bond & Co., which was an exhibit not often excelled, and the amount of work and taste displayed in arranging the different articles comprised in a very large collection does great credit to those who got it up. The show of stoves was very good The great improvement in this branch of business has been marked during the last few years. To see a handsome stove a few years ago was an exception, while now it is the rule. Mr. Wm. Sunley was by far the largest exhibitor, showing, as agent, the product of four or five different companies.

In reference to the other departments of the Exhibition, all we can say is that it was fully equal to those of former years. One novel feature in the class for natural history was a fine display of curiosities collected from all parts of the world, but more especially from Australia and New Zealand, comprising beasts, birds, fossils, shells, insects, etc., etc., shown by Mr. J. W. Lyon. This was very attractive, and formed one of the principal features of interest in the building.

We would recommend that rule No. 13, referring to fraud, deception or dishonest practices in making entries, be strictly enforced upon its being known that any has been practised, and it is the duty of every one who knows and can prove that such has been

the case, to bring it before the Board. It has been hinted that persons have exhibited articles that were not of their own growth or manufacture.

The present mode of entering animals and articles at the exhibitions has long been felt to be wrong in principle and detrimental to the interest of those institutions. Anyone by paying one dollar or two, as the Directors may agree upon (the law will not allow any more to be charged), and receiving in return a dollar's worth of tickets, may enter for every prize offered, and then go to the Secretary and claim herdsman's passes, enabling him to sell his four tickets and so rob the Society of so much. This we contend is wrong, and we are glad to find that the Directors of the Toronto institution have adopted a more equitable way, by making a charge for each entry for all animals and poultry, also for manufactures where they do not pay for space, which is charged at so much per foot frontage, and these fees amounted in some cases to from $13 to $18, and they have to pay for member's tickets besides, whereas they would only have paid one dollar if entered in the old way. We would recommend our successors to take this matter into serious consideration.

Guelph Horticultural Society.

The Directors, in making this their Annual Report, wish to bring before the members the transactions of the past year, and in doing so would first state that, in consequence of not being able in former years to meet our liabilities in full, it was decided that only honorary prizes be paid for the Spring Show, leaving all funds at liberty to make a good list for the Fall Exhibition. This was done, and to the credit of the members is due the very excellent display then made, showing that it is not all the dollars and cents that gardeners and amateurs exhibit for, but for the honour of gaining the prizes.

The Fall Show was held on the 3rd of September, and, as usual at this season of the year, was a great success as far as exhibits went, but the receipts at the doors were the least we have ever had. This may be attributed in a great measure to the unpropitious weather, it having rained nearly all the afternoon and evening, thereby preventing many who always patronize the exhibition attending.

We would call the attention of our successors to the necessity of making a thorough and vigorous canvass through the city for subscriptions, as many would subscribe if they were called upon. We are sorry to say that some seventeen dollars remain uncollected from last year, and when so long remaining it is doubly hard to collect. It seems as if you were making two collections in the one year. We append the financial statement, which we are happy to say shows a balance in favour of the Society. We would recommend our successors to follow the same course this year, and have only one show, and that in the fall, by so doing they will be able to keep up the Society, make both ends meet, otherwise they cannot, as the funds at their disposal will not allow it, the Government grant having fallen off from $140 in 1877 to $61 in 1879, owing to more Township Agricultural Societies claiming portions of the Government grant.

We are pleased to inform the meeting that a collection of plums, contributed by some members of the Society and entered for competition at the Provincial Exhibition by Mr. Sunley, "for the benefit of this Society," gained the prize of a silver medal and $15 in cash, which has been handed over to the Secretary.

We think the thanks of the Society are due to Mr. Sunley for the trouble and expense he went to, and also for paying over the handsome amount realized.

YORK, NORTH.

In meeting you again, at the close of another year, your officers and Directors have much satisfaction in being able to report that, notwithstanding the continued monetary depression, especially up to last harvest, militating largely against maintaining the membership quite up to the usual standard of former years, yet the Society may be regarded as in a flourishing condition.

In order to ensure a better oversight over the Society's buildings and grounds, the dwelling-house thereon has been thoroughly repaired and refitted, and a caretaker placed in charge, whose duty is to watch over the Society's property ; while at the same time the Association will receive some return in the shape of rental therefrom, sufficient, at least, it is hoped, to warrant the outlay ; for when the sum heretofore paid for caretaking is considered, added to the rental the Board anticipates will be realized, it will amount to large interest on the outlay. The Treasurer's statement, herewith submitted, shows the sum expended in these improvements.

The Fall Exhibition, held in Newmarket, on the 7th and 8th days of October last, was a grand success. As previously intimated, in consequence of the scarcity of money previous to last harvest, the membership did not reach the number of some previous years, while the establishment of a Central Fair at Toronto also had its influence in lessening the interest in more local organizations. But notwithstanding these untoward circumstances the entries exceeded the average of the past four years, while the attendance of visitors exceeded the anticipations of your Board. This is exceedingly gratifying, and affords room for congratulation. In order to show how generally the exhibition was sustained, the following totals of entries in the different classes will exemplify :—

Horses	291
Cattle	80
Sheep	103
Swine	51
Poultry	153
Grain and seeds	139
Roots and vegetables	277
Fruits and domestic wines	244
Dairy	60
Implements, etc.	179
Domestic manufactures, fine arts, etc	397
Total	1,974

Excepting purely ornamental decorations (which your Board thought best to abandon this year), the floral hall was never better filled, and the creditable display made was the general theme of observation by visitors. On the first night of the exhibition, more especially to meet the wants of the people of Newmarket who find it impossible to attend through the day, your Directors illuminated this part of the show ; and it is gratifying to know that the result more than covered the expenses incurred, after paying cost of lamps, etc. Your Board would recommend a continuance of these night exhibitions on the evening of the first day of the show in future.

To make the improvements to the dwelling for a caretaker previously referred to, and also to meet the outlay consequent upon the damage done by a storm during the winter of 1878-9, which unroofed the carriage-shed, one hundred feet long, your Board was obliged to borrow $300 ; with this they met all expenses of repairs, paid all accruing interest, increased the prize-list considerably, and drained certain portions of the grounds, and have a balance on hand nearly double of the amount with which the year's operations were commenced The financial statement, herewith submitted, furnishes full particulars, which your Board trust will be satisfactory to the membership, showing that with the $300 borrowed they paid from the resources of the Association, all accrued interest, and about $400 for improvements, and have a balance on hand of $104.21, as compared to $54.01 on hand at the close of last year, notwithstanding the very considerable increase made to the prize-list.

The annual excursion, held under the auspices of the Society, was not so successful as on some previous years, no doubt owing to the stringency of the money market previous to last harvest, which necessitated people to husband all their resources; at the same time it resulted in a small balance to the credit of the Society.

Your Board desires to acknowledge with gratitude the very generous assistance received, by way of donations to the prize-list, from the business community of Newmarket and representatives in Parliament and Legislative Assembly. The response given by them to the appeal for aid was creditable to their generosity, and evinced their good wishes for the success of the Association in an unmistakable manner. It is unnecessary to allude to their names here, but the prize-list tells who they were, whom your Board commend to the consideration of this Society. * * * *

Whitchurch.

The Society held the Fall Show at Stouffville, on the 30th day of September and the 1st day of October. The days were fine, and a very large number of people attended the show. The interest in the exhibition appears not to have decreased, as the entries with the Secretary were about 1,000, and the receipts of gates and grounds equalled that of any previous year.

The Nipissing Railway Company cheerfully granted all the accommodations asked for by the Society, and Edward Wheeler, Reeve of Stouffville, generously placed at the control of the Society one of the best fields in the county on which to hold a show. Your Directors recommend that the thanks of this Society be tendered to the Directors of the Nipissing Railway Company, to E. Wheeler, Reeve of Stouffville, and to those who added special contributions to the prize-list.

The several classes in horses were well represented, and some very fine animals were exhibited. The exhibit of cattle and sheep would do credit to a Provincial Exhibition. The show of swine was not numerous, but those on exhibition made as decent appearance as could be expected from descendants from that species of the animal kingdom. The show of poultry was good, and the varieties a study for bird-fanciers. The show of machinery and implements was smaller than usual, but of a quality that met general approval. The grain and seeds on exhibition were as good as could be desired, and the roots and vegetables excellent. The fruit was a proof of the adaptability of the Canadian climate for fruit culture. The show in dairy produce was a duplicate of other years; and the ladies' department large, varied and appreciative.

The financial report shows the circumstances of the Society to be in a very healthy condition, the friends of which may feel complimented in being associated with one of the best township societies in the Province, with bright prospects for the future.

Your Directors are of opinion that when societies become *too local*, or are nursed into existence for speculative purposes to a few who sport a shingle at the street corners, that such society has lost its usefulness, unless it never had any.

Concerning the differences of temperature and soils, it may be uncertain to risk an opinion on book-farming, but experiments that are not *too expensive* might prove an advantage to careful observers.

With respect to the harvest of 1879, it may be considered from fair to good, and as near the expectations of the farmer as could be anticipated.

Your Directors do not propose to conclude this report without acknowledging the goodness of an allwise Providence for His manifold blessings to us—that while the destructive hand of war has been severely felt in some countries, and famine in others, we have been blessed with peace, plenty and prosperity.

YORK, WEST.

It is very encouraging indeed to your Directors to be able to meet you, as they do, at this another annual meeting, with a report of a successful and prosperous year such as is most satisfactory to themselves and such as cannot fail to be highly pleasing and gratifying to your Society. In the early part of the year your Directors admitted the Board of the Township of Vaughan Agricultural Society to union with them on a basis somewhat

similar to that of former unions, with, however, this difference that the township paid to your Board the sum of $60 to assist in a Spring Fair instead of $40 as was the case with former unions.

The number of entries at the Annual Fall Show were as follows:—Horses, 230; cattle, 130; sheep, 135; pigs, 61; poultry, 100; roots, 80; vegetables, 69; fruits, 132, of which 113 were apples; grain and seeds, 108; implements, 80; dairy produce, 148, 81 of which were entries for butter; home manufactures, 127; ladies' work, 120; fine arts, 39—being an increase of entries compared with any former year. There was also quite a marked superiority in the stock exhibited over that of preceding years.

From the very noticeable increase in the interest taken in agricultural pursuits, as well as the marked increase both in the number of members and entries made, your Directors deem it one of the indications of that gradual return of better times, for which we have all been so anxiously looking and to which the present year's crop in Canada must certainly, to a considerable extent, contribute. In this immediate neighbourhood, however, the crops have been slightly below the average, as, for instance, fall wheat will not average more than about seventeen or eighteen bushels per acre, the reason of which is the land being in poor order last fall owing to the wet weather, the wheat, or at least the greater part of it, was not sown till late, so that in many cases it was barely through the ground when the frost came; then again the spring was unfavourable, not only to the wheat crop but to all other crops, on account of drouth, thereby preventing them (particularly in the case of fall wheat) spreading or stooling out as they should and would otherwise have done. Spring crops on the whole were good, and the hay crop was extra. Prices for wheat and barley ranged low in the early part of the season, but are now very fair, although not yet perhaps as high as might be. One cause of low prices in the early part of the season was the probabilities of Great Britain not requiring to import so much as was expected at the time of harvesting, for notwithstanding the heavy rains just as their crops were ripening, there was no very great damage done. The small production of wheat, and the falling off in the deliveries, to a certain extent caused an advance in the price. And when we take this, together with the complete control of the Canadian markets, and the fact that some of the Continental countries require a supply from abroad, it may lead us to hope that wheat will yet reach a much better price. As to the price of barley, but little can be said as so much depends on the brightness of the grain—it therefore necessarily behoves the farmer to be very careful both in harvesting and housing his barley.

Your Directors would offer as a suggestion, for bettering the farming community, the benefit of a few shade-trees being planted over the farms, the trees having a tendency to draw moisture, and besides that would be very beneficial to stock in and during the summer months. Another suggestion your Directors would offer is that of a sort of co-operative system, or in other words, for the farmer to give his sons a share or interest in all the produce of the farm instead of merely giving them a low wage as they might do in the case of a hired servant. Under such a system they (the farmers' sons) would have a greater interest in home affairs, there would be a greater incentive to make the *best* of everything, and there would be a less tendency of the young farmer running off after mercantile or other pursuits.

The bad weather which prevailed on the days of the annual Fall Fair for the last two years had the effect of reducing the financial standing of your Society. But this present year your Directors are happy to be able to state that a very decided step has been made toward regaining our usual standing.

Your Directors would also suggest the advisability of taking an interest or share in the agricultural buildings erected here in Woodbridge, and thereby making the annual fairs a permanency.

In conclusion, your Directors would also suggest the advisability of making an effort to do away with the petty jealousies that now exist between the township societies in this electoral division.

ANALYSIS OF REPORTS

OF

County and Township Agricultural Societies

AND OF

HORTICULTURAL SOCIETIES,

FOR THE YEAR 1879.

ANALYSIS of Reports of County and Township Agricultural Societies and of Horticultural Societies.

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Total of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Addington:		128 00	700 00							828 00	41 74
Camden	57 48	95 00	153 00							305 48	
Loughboro'	0 35	80 00	121 00							201 35	2 65
Portland	41 45	50 00	76 00							167 45	
Algoma:	0 67	141 75	700 00						22 00	864 42	
Assiginack	85 59	60 00	140 00	135 00						420 59	
Howland	9 72	50 00	140 00	20 00			127 00			346 72	
Brant, North:	1245 04	307 50	700 00	100 00	387 66				90 00	2830 20	
Onondaga	24 87	100 50	140 00	20 00	14 75				5 00	305 12	
Brant, South:	204 26	623 00	700 00	100 00	2456 75				314 32	4398 33	
Burford		240 00	140 00		270 00				92 75	742 75	
Brockville, E. D		76 00	700 00	100 00	269 55				94 00	1239 55	209 12
Bruce, North:*	216 30	90 00	700 00							1006 30	
Union Exhibition		120 25		100 00	649 82			643 70		1513 77	
Arran	27 23	168 50	82 90	60 00	50 09				1 00	389 72	
Bruce	151 85	166 00	78 85	20 00	12 70				8 00	437 40	
Elderslie	159 02	294 00	102 05							555 07	
Saugeen		174 00	76 25	30 00	141 50			485 35		907 10	

* United with Elderslie in Union Exhibition held in Paisley.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden, and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Addington:	13 61	350 00	205 25	76 00	157 25	.....	.....	.....	.....	.....	67 63	869 74	.....
Camden	.....	.....	118 50	56 25	61 50	.....	.....	.....	.....	.....	24 75	261 00	44 48
Loughboro'	.....	.....	94 00	58 30	30 00	.....	.....	.....	.....	.....	21 70	204 00	.....
Portland	.....	.....	64 70	13 60	36 10	.....	.....	.....	.....	.....	35 50	150 05	17 40
Algoma:	.....	280 00	.....	.....	.....	.....	.....	429 35	.....	43 65	109 56	862 56	1 86
Assiginack	.....	.....	79 75	41 25	19 75	.....	1 50	.....	.....	184 00	90 48	416 73	3 86
Howland	.....	.....	82 75	35 75	26 75	.....	.....	81 60	.....	.....	64 46	291 31	55 41
Brant, North:	.....	140 00	583 25	151 50	154 25	.....	167 25	.....	.....	95 22	*931 01	2222 48	607 72
Onondaga	.....	.....	158 50	45 25	34 75	.....	7 25	.....	.....	.....	34 43	280 18	24 94
Brant, South:	.....	140 00	897 00	633 25	534 50	.....	49 50	.....	.....	830 97	1298 10	4383 32	15 01
Burford	14 92	.....	†330 75	103 50	97 75	.....	7 00	.....	.....	66 12	109 21	707 50	35 25
Brockville, E. D.	88 48	.....	‡538 10	283 80	320 92	64 00	6 30	.....	.....	139 74	278 33	1448 67	.....
Bruce, North:	.....	420 00	.....	.....	.....	.....	.....	.....	368 70	.....	60 63	848 70	157 60
Union Exhibition	.....	.....	559 75	255 25	226 00	.....	.....	.....	.....	134 01	338 76	1513 77	.....
Arran	.....	.....	108 00	69 50	79 50	.....	1 00	.....	.....	5 90	67 30	331 20	58 52
Bruce	.....	.....	97 75	66 75	55 25	.....	8 25	.....	.....	17 00	55 93	300 93	136 47
Elderslie	.....	.....	.....	.....	.....	.....	20 75	.....	397 35	.....	2 50	420 60	134 47
Sangeen	.....	.....	165 25	93 75	85 20	.....	.....	.....	.....	239 74	149 38	733 32	§173 78

* Including $685.00 of last year's liabilities.
† $21.75 of prizes unpaid.
‡ $271.00 retained as percentage on prizes.
§ Of which one-half belongs to the Port Elgin Horticultural Society, which united for Exhibition.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Bruce, South *:	2 38	338 00	700 00	.....	.....	.....	.....	.....	.....	1040 38	.....
Northern Exhibition	88 78	594 00	.....	200 00	1851 63	1496 00	.....	1005 88	195 16	5431 45	.....
Brant	2 46	104 00	48 30	.....	.....	.....	.....	.....	.....	154 76	.....
Carrick	.....	160 00	60 85	40 00	72 15	.....	.....	.....	5 00	338 00	29 54
Culross	82 64	100 25	44 60	.....	33 50	.....	.....	.....	.....	260 99	.....
Greenock	.....	95 00	39 00	20 00	11 62	.....	.....	.....	3 50	169 12	3 59
Huron	22 22	143 50	68 50	20 00	35 20	.....	.....	.....	26 00	315 42	.....
Kinloss	77 86	157 00	72 65	20 00	133 98	.....	.....	.....	101 50	562 99	.....
Kincardine	.....	91 61	37 60	.....	9 70	.....	.....	.....	.....	138 91	.....
Walkerton Horticultural †	9 30	100 00	45 50	.....	.....	.....	.....	.....	.....	154 80	.....
Cardwell:	104 31	529 25	700 00	30 00	321 00	.....	.....	.....	203 40	1887 96	.....
Adjala	.....	162 00	115 39	25 00	92 25	.....	.....	.....	12 00	406 64	84 44
Albion	26 60	165 50	96 36	80 00	108 10	.....	.....	.....	48 20	434 96‡‡	13 19
Caledon	157 49	133 25	100 00	50 00	217 35	.....	.....	.....	89 60	747 69	.....
Tecumseth §	94 30	164 00	117 60	.....	.....	.....	.....	.....	.....	375 90	.....
Carleton:	326 91	304 63	700 00	.....	70 62	.....	.....	.....	.....	1302 16	.....
Fitzroy	2 04	70 00	140 00	.....	.....	.....	.....	.....	.....	212 04	.....
March	12 12	73 00	140 00	.....	.....	.....	.....	.....	6 49	231 61	.....
North Gower and Marlboro'	44 54	95 00	140 00	.....	.....	.....	.....	.....	.....	298 94	.....
Cornwall, E. D.:	.....	130 00	350 00	.....	.....	480 00	.....	.....	.....	960 00	.....

* United with Walkerton Horticultural Society for Northern Exhibition.
† United with South Bruce for Northern Exhibition.
‡‡ Being less $80.80 retained by Insolvent Treasurer.
§ United with Electoral Division Society for Exhibition.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Best Managed Farms.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Bruce, South:		417 50								620 38		2 50	1040 28	
Northern Exhibition			1325 25*	671 50	926 25			144 50			1046 00	1382 41	5382 16	49 29
Brant										140 00		11 50	151 50	3 26
Carrick	110 45		112 25	50 75	44 00						7 53	42 56	367 54	
Culross			85 50	28 00	18 50						4 30	38 00	174 30	86 69
Greenock	3 35		63 25	48 75	24 75						5 00	27 61	172 71	
Huron			126 25	75 00	32 00							64 87	298 12	17 30
Kinloss			126 00	78 00	67 95						50 00	107 71	429 66	133 33
Kincardine			54 50	29 00				5 88				36 51	125 89	13 02
Walkerton Horticultural										140 50			140 50	14 30
Cardwell:		418 35	503 50	258 75	225 00						107 00	269 26	1781 86	106 10
Adjala	163 41		191 00†	82 75	79 50		38 26	1 00			5 00	60 00	491 08	
Albion			188 00	68 00	85 25						36 40	70 50	448 15	
Caledon			209 00	134 75	172 25							122 90	638 90	108 79
Tecumseth								3 00		372 90			375 90	
Carleton:		420 00	132 00	36 00	39 00			77 00			324 59	165 25	1193 75	108 41
Fitzroy			87 50‡	105 25	55 75							50 93	203 13	8 91
March			126 20	68 01							11 54	26 50	229 25	2 36
North Gower and Marlboro'			103 75	62 75	41 00	1st, Gold Med'l 2nd, $10 00	16 50	2 25				31 53	267 78	31 16
Cornwall, E. D.	22 94										758 65	150 00	931 59	28 41

* Prizes unpaid, $113.75.
† $129.95 of prizes not paid, being discounted or forfeited.
‡ $96.30 deducted from prizes awarded, as per by-law.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Dufferin:	45	467 10	700 00	200 00	749 00	1430 96				3547 51	
Melancthon	111 46	136 00*		50 00	226 00				16 00	539 46	140 92
Orangeville Horticultural		111 00	106 40		8 05					225 45	
Dundas:		254 00	700 00		212 00					1166 00	20 77
Matilda	93 06	129 00	104 00		104 75					430 81	
Mountain	37 23	72 00	64 00							173 23	
Williamsburgh	30 42	125 00	103 00		78 75				16 00	353 17	
Winchester	15 86	165 00	140 00		6 40					327 26	
Durham, East†:	3 64	102 00	700 00						4 00	809 64	20 39
Cavan		98 00	140 00		108 93				18 00	364 93	
Hope	11 79	154 20	140 00		338 50			245 00		889 49	
Manvers	19 47	71 75	140 00		141 41					372 66	
Durham, West:	93 09	97 00	700 00		797 44			198 65	23 75	1909 93	
Cartwright	165 97	174 50	140 00		156 50					636 97	
Clarke	199 86	229 00	140 00	60 00					27 50	983 66	
Darlington		111 00	99 90							210 95	
Bowmanville Horticultural	13 88	44 00	40 50		10 60					108 98	

* Grant of $129.20 received too late for audit.
† United with Hope for Exhibition.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Dufferin		235 60	368 00	250 80	290 00		179 50				2121 83*	3443 75	103 78
Melancthon			113 50	64 25	91 75					323 58	87 30	680 38	
Orangeville Horticultural				129 25			8 00				26 30	163 55	61 90
Dundas	40 16	411 06	258 88†	76 68	88 69		8 15			91 56	165 36	1186 77	
Matilda			101 50	41 50	70 00	14 00	19 25			64 95	55 96	367 16	63 65
Mountain			70 25	21 30	32 75						24 11	148 41	24 82
Williamsburgh			99 40	33 20	58 15					52 15	51 35	294 25	58 92
Winchester			153 05	29 50	27 35		1 65			3 92	38 63	254 10	73 16
Durham, East		420 00					19 00		245 00	100 00	46 03	830 03	
Cavan			132 50	50 93	37 46					72 54	71 50	364 93	
Hope			490 00‡	128 25	96 75					97 80	161 17	887 97	1 52
Manvers			90 75	31 50	45 00		10 25			49 25	41 31	268 06	104 60
Durham, West		420 40	637 25	286 75	270 75					22 32	130 47	1767 94	141 19
Cartwright			265 00	56 50	62 75		13 00			39 91	75 00	512 16	124 81
Clarke			317 00	84 75	167 10	59 00	9 00			26 50	121 59	784 94	198 72
Darlington §									198 65		12 25	210 90	
Bowmanville Horticultural				79 00							6 55	85 55	23 43

* Including $1593 as loans and interest.
† $46.32 for Extra Prizes not classified.
‡ $86 Prizes unpaid.
§ United with County Society for Exhibition.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
ELGIN, EAST:	37 43	91 00	700 00		188 60					1017 03	
Bayham	80 56	80 50	52 51						6 25	219 82	
Dorchester, South	20 08	221 00	140 00		72 50					453 58	
Malahide	18 15	224 00	127 74	50 00	191 65	300 00			84 14	995 68	
Yarmouth		144 00	86 09		103 10				25 00	358 19	50 13
ELGIN, WEST:		238 00	700 00		526 03				96 50	1560 53	
Aldborough	41 01	88 00	140 00		49 05					321 06	
Southwold and Dunwich		195 00	140 00		53 60		942 00		22 00	1352 60	
ESSEX, NORTH:	61 20	149 00	700 00	100 00	146 00				8 50	1164 70	
Maidstone and East Sandwich	391 87	72 00	117 50				11 50			592 87	
Rochester and Maidstone	51 78	103 50	176 25						29 00	360 53	
Tilbury, West	116 40	88 50	126 14		7 70				6 00	344 74	
ESSEX, SOUTH:	335 42	202 00	700 00	100 00	229 80				9 00	1576 22	
Colchester	73 28	209 00	111 34	100 00	47 06		201 42			742 10	
Gosfield	87 87	100 00	89 07		75 70		15 00		95	368 59	
Malden and Anderson	29 41	33 20	29 10							91 71	
Mersea	102 90	216 00	190 49		212 73	57 10	361 90		10 00	1151 12	
FRONTENAC:	413 11	839 00	700 00	400 00	1698 91				41 34	4092 36	
Kingston	1 50	140 00	100 09							241 59	
Storrington	66	51 00	55 00							106 66	

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
ELGIN, EAST:	.....	406 58	138 87	53 58	42 62	.. ...	4 19	.... ..	....	27 00	147 00	819 84	197 19
Bayham	.....	.....	78 26*	50 55	14 96	.....	31 26	.....	.....	.....	38 29	193 66	26 16
Dorchester, South	.....	.....	193 75	84 75	48 75	.....	.....	.....	.....	10 00	38 54	375 79	77 79
Malahide	.....	.. .	185 75	80 70	60 00	.....	17 25	.....	.....	210 45	102 50	756 65	239 03
Yarmouth	15 33	.....	157 00	58 00	48 00	.....	.....	.....	.....	82 00	47 99	408 32	.....
ELGIN, WEST:	88 88	280 00	491 33†	144 82	144 80	76 00	25 85	... ...	.... ..	90 88	215 75	1499 76	60 77
Aldborough	.....	.....	98 86	20 95	14 30	.... ..	13 00	.....	... ...	8 92	64 38	220 41	100 65
Southwold and Dunwich	41 52	.....	165 65‡	60 65	84 29	.....	11 35	771 42	.....	19 96	133 00	1269 25	83 35
ESSEX, NORTH:	.....	419 89	311 50	123 00	100 25	.....	11 25	.....	.....	8 75	110 53	1085 17	79 53
Maidstone and East Sandwich	....	.....	.....	.....	.....	.....	.....	373 00	.....	.....	34 05	407 05	185 82
Rochester and Maidstone	.....	.....	.....	.....	.....	.....	.....	161 00	. .....	49 90	19 75	230 65	129 88
Tilbury, West	....	.....	87 75	27 25	14 25	19 00	.....	.....	.....	....	32 34	180 59	164 15
ESSEX, SOUTH:	.....	420 00	506 61	142 51	127 95	.....	.....	.....	... . ..	... . ..	186 15	1383 21	193 01
Colchester	.....	.. ..	51 75	12 25	12 50	.....	.....	562 80	.....	32 30	50 28	721 88	20 22
Gosfield	.....	.....	62 20	27 35	23 20	.....	.....	30 00	.....	16 00	48 76	207 51	161 08
Malden and Anderson	.....	.....	.....	.....	.....	.....	.....	21 65	. ....	.....	13 46	35 11	56 60
Mersea	.....	.....	125 25	37 69	48 45	.....	2 50	740 50	.. .. ..	27 60	118 63	1100 62	50 50
FRONTENAC:	.....	155 00	919 00	417 50	720 50	.....	38 75	.....	.....	209 38	838 75	3299 63	792 73
Kingston	.....	.....	149 00	49 00	21 00	....	.....	... ...	.....	.....	15 50	234 50	7 00
Storrington	.....	.....	58 90	18 77	11 60	.....	.....	.... ..	.....	.....	13 48	102 75	3 91

* $19.66 of prizes unpaid.
† $58.55 of prizes unpaid.
‡ $19.50 of prizes unpaid.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Grenville, South:	77 13	196 00	700 00	100 00	82 00				93 66	1248 84	
Edwardsburgh	33 30	78 06	140 00	20 00	59 25					330 61	
Grey, North:	27 46	118 00	700 00	458 85	206 53					1510 84	
Derby	55 81	78 00	94 62	25 00	13 95				20 75	286 13	
Keppel	32 02	98 00	121 07	12 00			37 00		25 00	325 09	
St. Vincent	71 58	129 30	142 57	30 00	41 89				13 00	428 34	
Sydenham	25 35	50 00	49 05	44 05						468 45	
Owen Sound Horticultural	110 50	106 00			225 43				5 76	447 69	
Grey, East:	5 60	134 00	700 00	246 00	168 20			90 00	3 00	1340 80	
Artemesia		28 00	54 55	17 76						100 31	
Collingwood	149 35	137 50	88 85	79 05	100 04				49 00	603 79	
Euphrasia		142 25	137 18	50 00	55 62				79 50	464 55	11 41
Holland	20 08	95 00	78 10	45 30						238 48	
Osprey	14 37	57 00	41 13	13 45						125 95	7 97
Proton	16 96	54 00	54 58		3 00					128 54	
Grey, South:	49 47	124 00	700 00	200 00	228 40		300 00		32 50	1634 37	
Bentinck		60 34	71 33	40 40						172 07	
Egremont	35 27	150 00	140 00	40 00					12 00	377 27	
Glenelg	22 97	68 00	87 74	20 00	16 00				13 95	228 66	
Normanby	3 78	141 00	140 00	35 00	6 90				10 75	337 43	

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden, and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Grenville, South		140 00	193 00	249 50	147 50					257 15	252 85	1240 00	8 84
Edwardsburgh			89 25	90 00	37 75						53 85	270 85	59 76
Grey, North	23 47	*540 00	274 50	285 75	75 00		21 25			89 60	248 21	1534 31	
Derby			79 00	60 50	14 00	42 50					50 22	246 22	39 91
Keppel			135 81	62 75	23 38		0 75				39 29	261 98	63 11
St. Vincent			124 25	54 50	50 25	22 50	33 25			12 51	45 07	342 33	86 01
Sydenham									†122 66		8 46	131 12	37 33
Owen Sound Horticultural				50 75					213 53		60 00	324 28	123 41
Grey, East		‡540 00	249 25	140 00	74 00		2 00			137 00	161 77	1304 02	36 78
Artemesia	0 21										1 25	91 46	8 85
Collingwood			179 75	90 25	116 75				§90 00		94 02	421 52	182 27
Euphrasia	14 55		103 50	55 50	52 00	60 00	4 00			125 92	60 49	475 96	
Holland			89 25	82 75	33 00						29 40	234 40	4 08
Osprey			57 75	27 00	24 00						25 17	133 92	
Proton			48 75	19 25	22 00						13 94	103 94	24 60
Grey, South		*540 00	221 50	141 00	57 75		9 00			446 12	153 55	1568 92	65 45
Bentinck			57 50	37 25	9 75		16 75				38 04	159 29	12 78
Egremont			120 75	52 00	49 00	32 00				5 00	44 27	303 02	74 25
Glenelg			62 25	44 25	42 75						33 41	182 66	46 00
Normanby			70 75	74 25	70 50					4 25	77 38	297 13	40 30

* $120 of which was County Grant.
† United with County Society for Exhibition.
‡ $120 of which was County Grant.

§ United with County Society.
$59.25 unpaid.
* $120 was County Grant.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
GLENGARRY:	30 38	327 50	631 50	.....	220 40	.....	.....	.....	20 25	1230 03	.....
Lochiel and Kenyon	14 09	69 50	140 00	.....	.....	.....	.....	.....	.....	223 59	.....
HALTON:	229 34	249 00	700 00	100 00	858 90	.....	.....	.....	29 00	2166 24	111 97
Esquesing	56 33	232 50	161 23	50 00	.....	.....	.....	.....	14 75	622 23	.....
Nassagaweya	.....	148 50	76 41	.....	14 20	.....	.....	.....	15 50	254 61	51 79
Nelson	.....	266 00	129 90	60 00	43 30	.....	.....	.....	10 00	509 20	8 12
Trafalgar	20 75	222 50	108 50	150 00	70 15	.....	.....	.....	.....	571 90	.....
HALDIMAND:	31 17	137 00	700 00	25 00	204 20	.....	.....	.....	.....	1105 37	.....
Cayuga, North	29 28	127 00	75 00	25 00	4 60	.....	.....	.....	.....	260 88	1 55
Dunn and South Cayuga	2 70	71 00	49 65	25 00	2 85	.....	.....	.....	.....	151 15	.....
Rainham	38 20	100 00	50 02	25 00	.....	.....	.....	.....	.....	213 22	.....
Seneca and Oneida	65 00	201 00	124 62	60 00	12 39	.....	.....	.....	.....	463 01	.....
Walpole	.....	226 00	114 08	25 00	150 95	.....	.....	.....	77 00	593 03	77
HAMILTON, E. D:	1140 27	575 00	350 00	100 00	.....	.....	.....	566 39	38 16	3069 82	.....
Great Central Fair	.....	907 50	.....	.....	4265 50	.....	.....	4913 57*	.....	10086 57	.....
HASTINGS, NORTH:	58 47	72 00	700 00	.....	.....	.....	.....	.....	3 00	833 47	.....
Dungannon and Faraday	28 77	48 00	98 00	.....	.....	.....	.....	.....	1 35	176 12	.....
Rawdon	66 35	91 00	140 00	.....	.....	.....	.....	.....	50	297 85	57
Tudor and Limerick	28 00	62 00	100 00	.....	.....	.....	.....	.....	.....	190 00	.....

* From North and South Wentworth Agricultural and Hamilton Electoral Division Societies.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
GLENGARRY:	.....	140 00	496 09	186 75	164 13	.....	2 00	.....	.....	91 90	211 96	1292 83	62 80
Lochiel and Kenyon	.....	.....	86 47	62 92	19 68	.....	.....	.....	.....	.....	28 50	210 57	13 02
HALTON:	.....	420 00	721 00	141 25	288 50	.....	40 00	.....	.....	395 15	272 31	2278 21	.....
Esquesing	.....	.....	232 00	93 75	79 75	30 00	.....	.....	.....	8 57	109 50	553 58	68 65
Nassagaweya	28 87	.....	158 00	48 25	37 00	.....	1 50	.....	.....	.....	32 78	306 40	.....
Nelson	2 32	.....	317 00	93 75	63 50	.....	.....	.....	.....	12 75	28 00	517 32	.....
Trafalgar	.....	.....	249 50	96 25	113 00	.....	.....	.....	.....	.....	85 56	544 31	27 59
HALDIMAND:	.....	420 00	300 75	54 75	92 50	.....	.....	.....	.....	14 25	88 49	970 74	134 63
Cayuga, North	.....	.....	135 00	47 10	43 20	.....	.....	.....	.....	.....	36 93	262 43	.....
Dunn and South Cayuga	.....	.....	74 35	19 45	11 75	.....	.....	.....	.....	.....	30 39	135 94	15 21
Rainham	.....	.....	113 50	19 50	27 25	.....	15 50	.....	.....	.....	24 87	200 62	12 60
Seneca and Oneida	.....	.....	250 25	54 25	66 25	.....	.....	.....	.....	27 00	59 31	457 06	5 95
Walpole	55	.....	354 00	77 50	95 00	.....	.....	.....	.....	1 50	65 25	593 80	.....
HAMILTON, E. D.:	.....	.....	.....	.....	.....	.....	.....	.....	2400 00	.....	196 50	2596 50	473 32
Great Central Fair	.....	.....	3412 00	1415 75	1247 50	.....	.....	.....	1095 82*	858 65	2056 85	10086 57	.....
HASTINGS, NORTH:	.....	258 00	193 50	61 65	100 65	.....	.....	45 50	.....	.....	82 79	742 09	91 38
Dungannon and Faraday	.....	.....	45 25	46 50	15 75	.....	.....	.....	.....	.....	24 90	132 40	43 72
Rawdon	.....	.....	102 47	45 90	37 63	.....	.....	.....	.....	.....	112 00†	298 42	.....
Tudor and Limerick	.....	.....	93 00	23 50	15 12	.....	.....	.....	.....	.....	49 13	180 75	9 25

* Balance divided among North and South Wentworth Agricultural and Hamilton Electoral Division Societies.
† Including $80 repaid Electoral Division Society.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.- *Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Hastings, East:	10 45	136 00	700 00	41 00						887 45	5 85
Hungerford	44 48	56 00	140 00		9 25				27 11	276 83	
Tyendinaga	7 90	72 00	140 00							219 90	
Hastings, West:	146 88	80 00	669 00		429 14				6 00	1361 02	
Belleville Horticultural	171 08	30 00	140 00							441 08	
Huron, East:	8 11	90 00	700 00	100 00				220 50	12 00	1130 61	
Grey	135 15	179 00	82 36	11 76	280 16				105 50	793 93	
Howick	3 46	102 00	70 00	10 00	40 00					225 46	
Hullett	21 31	265 00	149 22		134 15					569 68	7 32
Morris	122 69	242 00	137 25	19 61						521 55	
Turnberry	7 67	168 75	101 55	14 39	140 25				380 41	813 02	
Huron, West:	113 95	115 00	700 00	100 00	188 50			683 70		1901 15	
Colborne *		59 00	23 35							82 35	
Wawanosh	236 62	137 00	83 50		79 21	250 00			39 75	826 07	
Goderich Horticultural†	162 59	350 50	172 35	100 00						785 41	
Huron, South:	85 53	106 00	700 00	100 00				650 00	139 00	1780 53	
Hay	115 08	204 25	81 42	11 63	90 17				37 03	539 58	
Stanley		183 25	81 19		42 50					306 94	17 21
Stephen and Usborne	357 73	404 00	165 52		434 00				50 00	1411 25	
Tuckersmith	364 45	295 00	101 71		540 90	1001 01			77 00	2380 10	

* Amalgamated with County Society.
† United with County Society.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Hastings, East:		280 00	212 25	94 20	119 60		19 00				168 25	893 30	
Hungerford			72 15	41 35	70 15						28 90	212 85	63 98
Tyendinaga			80 50	42 75	32 65					27 03	27 40	210 33	9 57
Hastings, West:		380 00	249 95	26 25	79 30					229 78	210 78	1176 06	184 96
Belleville Horticultural				170 90			19 25				22 47	212 62	228 46
Huron, East:		480 00	267 50	64 00	112 75*		19 75				111 60	963 88	166 76
Grey†							47 75		220 50	412 04	62 55	742 84	51 09
Howick			68 00	36 05	25 30					6 00	46 96	176 31	49 15
Hullett			230 20	48 50	51 00		23 75			114 80	108 70	577 00	
Morris			229 75	51 80	58 75						59 48	399 78	121 77
Turnberry			181 50	67 00	102 50	88 00	17 15				220 77	676 92	136 10
Huron, West:		477 85‡	401 00	485 00	158 00					31 15	310 32	1866 32	34 83
Colborne									60 85		21 50	82 35	
Wawanosh			79 00	23 50	25 20					535 10	19 25	682 05	144 02
Goderich Horticultural									622 85			622 85	162 59
Huron, South:		381 47	649 00	202 00	171 60						252 15	1655 62	124 91
Hay			161 50§	77 00	65 95		35 50			9 00	56 25	382 95	156 63
Stanley	1 47		103 00	78 25	57 00					22 60	61 58	324 15	
Stephen & Usborne			705 00	177 25	120 00					60 00	200 95	1263 20	148 05
Tuckersmith			5 00	45 00			65 50		650 00	1372 43	120 97	2258 90	121 20

* $91.75 of prizes unpaid.
† United with County Society for Exhibition.
‡ $58.75 County Grant.
§ $22.25 of prizes unpaid.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
KENT, EAST:	162 89	261 00	700 00	200 00	334 05				100 00	1757 94	
Camden	114 98	206 25	95 22		73 50					519 95	
Harwich	92 27	242 25	124 00		276 04		323 66			1058 22	
Howard	81 19	230 00	102 22		262 58				49 50	725 49	63 12
Orford		348 39	85 28	400 00	224 00	700 00				1757 67	
KENT, WEST:	234 39	303 00	700 00	250 00	1098 49		264 00		468 00	3317 88	
Raleigh	2 46	87 00	118 96			100 00	784 30		1 50	1094 22	
Chatham, Dover and Sombra	106 69	128 50	125 53	65 00	65 69				17 90	509 31	
Tilbury, East	20 49	103 00	127 66	58 00	7 80				155 32	472 27	
Chatham Horticultural Society	38 47	55 00	79 80	40 00	11 80					225 07	
KINGSTON E. D.	305 96	161 00	350 00		9 64					826 60	
LAMBTON, EAST:	276 49	278 00	699 00	199 75	312 65				100 00	1865 99	
Bosanquet	22 96	115 00	64 44	50 00	53 60					306 00	
Brooke	173 32	114 50	72 00							359 82	
Euphemia and Dawn	65 69	108 00	62 99	30 00	38 40					305 08	
Plympton and Wyoming	11 68	196 50	134 94		85 65				6 25	435 02	
Warwick	29 00	186 50	116 25	20 00					50	352 75	
LAMBTON, WEST:	101 26	143 30	700 00	200 00	113 20		1450 00*	1037 50†		3745 26	270 83
Enniskillen	47 10	145 50	101 00	250 00	22 00				7 50	573 10	
Moore	66 83	146 40	115 85	20 00	12 80				4 15	366 03	
Sarnia	121 40	165 50	135 00	250 00					436 50‡	1108 40	

* Proceeds of old grounds and buildings.
† Sarnia Society; $224.00 for union, and $813.50 towards new grounds and buildings.
‡ For grounds and buildings.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.– *Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
KENT, EAST:	.....	420 01	496 25	101 75	125 25	.....	.....	.....	.....	.....	233 26	1376 52	381 42
Camden	.....	.....	150 60	48 70	126 35	.....	.....	.....	.....	22 16	56 00	403 81	116 14
Harwich	.....	.....	143 50	62 25	56 50	.....	11 50	540 27	.....	112 05	81 62	1007 69	50 53
Howard	.....	.....	196 30	71 70	91 75	.....	.....	.....	.....	303 55	125 31	788 61	.....
Orford	51 97	.....	123 70	57 32	31 03	.....	.....	.....	.....	1388 80	104 75	1757 67	.....
KENT, WEST:	.....	420 00	478 25	172 75	314 50	56 00	30 75	379 00	.....	313 26	394 83	2559 34	758 54
Raleigh	.....	.....	97 75	39 90	19 00	.....	.....	523 65	.....	1 09	232 65	911 95	182 27
Chatham, Dover and Sombra	.....	.....	97 75	41 30	58 05	19 00	.....	32 25	.....	34 29	82 25	364 89	144 42
Tilbury, East	.....	.....	97 95	25 85	16 92	.....	.....	264 54	.....	45	13 63	419 34	52 93
Chatham Horticultural Society	.....	.....	.....	78 50	.....	.....	29 35	.....	.....	.....	50 00	157 85	67 22
KINGSTON E. D.	.....	.....	27 00	120 00	84 00*	.....	.....	.....	.....	.....	183 38	407 63	418 79
LAMBTON, EAST:	.....	420 00	331 63	178 57	253 65	.....	7 75	.....	.....	57 50	346 70	1565 80	300 17
Bosanquet	.....	.....	97 50	47 25	54 50	.....	3 00	.....	.....	6 40	34 12	242 77	63 23
Brooke	.....	.....	122 70	39 75	40 70	.....	.....	.....	.....	.....	40 93	244 08	115 74
Euphemia and Dawn	.....	.....	137 00	47 50	48 35	.....	.....	.....	.....	7 50	27 87	278 22	26 86
Plympton and Wyoming	.....	.....	170 90	71 50	55 30	.....	.....	11 25	.....	.....	118 58	427 53	7 49
Warwick	.....	.....	90 25	45 45	43 60	107 00	.....	.....	.....	.....	38 50	324 80	27 95
LAMBTON, WEST:	.....	420 00	420 19	171 20	122 37	.....	4 55	.....	.....	2552 16	325 62	4016 09	.....
Enniskillen	.....	.....	93 05	46 15	49 95	.....	55 85	.....	.....	106 50	73 05	424 55	148 55
Moore	.....	.....	95 40	32 00	18 20	.....	.....	.....	.....	3 59	109 01	258 20	107 83
Sarnia †	.....	.....	.....	.....	.....	.....	5 00	.....	224 00	813 50	59 86	1102 36	6 04

* $6.75 of Prizes unpaid.
† United with County Society.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
LANARK, NORTH:	... ...	363 00	700 00	150 00	501 20	... ...	... ...	... ...	... ...	1714 20	142 07
Dalhousie	... ...	68 10	193 50	... ...	... ...	175 00	166 33	... ...	... ...	602 93	... ...
Lanark	80 48	108 50	140 00	... ...	32 30	... ...	138 71	... ...	31 75	531 77	... ...
Pakenham	... ...	119 00	140 00	15 00	... ...	... ...	... ...	... ...	3 00	277 00	... ...
LANARK, SOUTH:	... ...	145 00	700 00	... ...	159 20	... ...	... ...	... ...	... ...	1004 20	167 49
Drummond	123 00	63 00	140 00	... ...	... ...	... ...	58 00	... ...	1 00	385 00	... ...
Montague	61 27	173 00	140 00	... ...	66 70	... ...	499 73	... ...	... ...	939 70	3 50
LEEDS, SOUTH:	9 36	187 75	700 00	100 00	386 67	... ...	... ...	... ...	73 12	1456 90	17 20
Bastard and Crosby	42 24	264 00	140 00	24 00	95 27	... ...	... ...	... ...	... ...	565 51	... ...
Crosby, North	... ...	129 00	115 00	16 50	... ...	... ...	21 50	... ...	104 87	386 87	... ...
Lansdowne	... ...	108 00	85 50	12 50	130 78	... ...	5 75	... ...	2 25	344 78	... ...
Leeds, Rear of	... ...	53 00	46 50	47 00	77 00	... ...	... ...	... ...	6 28	227 78	28 32
NORTH LEEDS AND GRENVILLE:	108 69	171 00	700 00	200 00	211 15	... ...	... ...	... ...	25 25	1415 40	... ...
Elmsley	16	94 82	103 70	... ...	41 90	... ...	... ...	... ...	1 50	242 08	... ...
Kitley	124 87	46 25	160 00	... ...	117 70	... ...	... ...	... ...	... ...	448 82	... ...
Oxford	... ...	96 45	111 32	... ...	21 50	... ...	... ...	... ...	... ...	229 27	12 58
Wolford	25 06	68 47	102 46	... ...	... ...	... ...	... ...	... ...	1 50	197 49	... ...
LENNOX:	32 28	240 00	700 00	... ...	... ...	... ...	... ...	... ...	... ...	972 28	65 53
Amherst Island	22 99	62 00	62 00	... ...	... ...	... ...	... ...	... ...	... ...	146 90	... ...
Ernestown	70 23	75 00	140 00	... ...	... ...	... ...	71 50	... ...	13 00	372 73	... ...

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Lanark, North:	60 00	505 33	448 25*	145 00	303 50	.....	.....	.....	.....	176 63	319 38	1856 27	.....
Dalhousie	92 31	.....	.....	.....	.....	.....	.....	214 45	.....	.....	195 25†	502 01	100 92
Lanark	.....	.....	56 75	57 15	37 30	.....	.....	111 29	.....	7 25	70 14	339 88	191 89
Pakenham	2 68	.....	76 50	76 25	36 70	.....	.....	33 75	.....	5 27	45 85	277 00	.....
Lanark, South:	35 55	280 00	194 75	84 25	128 30	.....	.....	.....	.....	309 57	138 97	1171 69	.....
Drummond	.....	.....	.....	.....	.....	.....	.....	207 16	.....	.....	28 50	235 66	149 34
Montague	.....	.....	107 50	89 00	96 00	15 00	.....	542 22	.....	15 51	77 97	943 20	.....
Leeds, South:	.....	447 00	335 75	114 95	234 00	.....	.....	.....	.....	158 94	183 46	1474 10	.....
Bastard and Crosby	.....	.....	141 00	123 00	29 00	.....	.....	.....	.....	212 00	29 00	534 00	31 51
Crosby, North	115 81	.....	90 00	68 25	54 50	.....	.....	.....	.....	.....	39 00	367 56	19 31
Lansdowne	26 48	.....	90 25	37 82	79 35	.....	.....	33 50	.....	.....	57 98	325 38	19 40
Leeds, Rear of	105 85	.....	37 50	21 65	17 65	.....	.....	.....	.....	22 95	50 50	256 10	.....
North Leeds and Grenville	.....	477 54	182 62	96 86	88 00	.....	12 00	.....	.....	.....	326 97	1265 39	150 01
Elmsley	.....	.....	87 95	54 12	58 30	.....	.....	.....	.....	7 00	22 97	230 34	11 74
Kitley	.....	.....	138 25	34 85	95 23	.....	.....	.....	.....	26 00	112 37	406 70	42 12
Oxford	18 63	.....	85 80	39 10	47 05	.....	3 52	.....	.....	4 50	43 24	241 85	.....
Wolford	.....	.....	83 30	54 30	25 10	.....	.....	.....	.....	1 00	23 87	187 57	9 92
Lennox:	.....	202 00	380 40	66 65	243 51	.....	24 50	.....	.....	.....	120 75	1037 81	.....
Amherst Island	.....	.....	79 95	28 45	14 85	.....	.....	.....	.....	.....	9 25	132 50	14 40
Ernestown	.....	.....	52 05	17 45	13 25	.....	.....	223 03	.....	5 97	28 21	339 96	32 77

* Less $102.25 retained as per by-law.
† $180.00 loan and interest.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Lincoln:	2 43	594 00	700 00	450 00	849 91	60 00	.....	.....	15 80	2672 14	.....
Clinton	.....	200 00	114 02	125 00	103 00	.....	.....	.....	145 15	687 17	.....
Grantham	37 79	174 00	101 22	.....	.....	.....	.....	.....	.....	313 01	.....
Grimsby	11 06	260 50	140 00	150 00	455 30	.....	.....	.....	72 53	1089 39	.....
Louth	.....	102 00	89 33	30 00	.....	.....	.....	.....	3 00	224 33	.....
London E. D.	433 85	1199 00	350 00	.....	.....	.....	.....	.....	33 58	2016 43	.....
Western Exhibition	4209 19	813 25	.....	.....	9765 04	.....	.....	2200 00	247 95	17235 43	.....
Middlesex, East:	644 99	235 00	700 00	.....	.....	.....	.....	.....	349 04	1929 03	.....
Dorchester, North	16 74	158 00	106 36	.....	.....	.....	.....	.....	.....	281 10	.....
London	.....	92 00	72 98	25 00	.....	.....	.....	.....	.....	189 98	46 02
Nissouri, West	51 83	184 50	124 21	.....	.....	.....	.....	.....	.....	360 54	.....
Westminster	11 00	200 00	116 45	.....	.....	.....	.....	.....	.....	327 45	.....
Middlesex, West:	.....	437 75	700 00	.....	318 65	.....	.....	.....	.....	1456 40	.....
Caradoc	48 74	207 00	126 00	.....	.....	.....	.....	.....	4 25	385 99	.....
Delaware	.....	97 00	57 40	.....	.....	.....	.....	.....	48 70	203 10	.....
Ekfrid	25 37	73 00	40 65	.....	.....	.....	.....	.....	9 45	148 47	.....
Metcalfe	44 27	87 50	45 15	.....	.....	.....	.....	.....	.....	176 92	.....
Mosa	4 81	143 00	86 80	.....	249 24	.....	.....	.....	100 00	583 85	.....
Strathroy Horticultural	16 22	85 00	56 00	.....	26 00	.....	.....	.....	5 00	188 22	.....

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Lincoln:		313 35	714 75	319 00	217 25					602 53	503 45	2670 33	1 81
Clinton	16 25		227 00	87 40	30 60					62 09	152 45	575 79	111 38
Grantham									275 22*			275 22	37 79
Grimsby			282 00	115 85	105 65					434 47	147 43	1085 40	3 99
Louth			109 25	38 75	28 50						28 25	204 75	19 58
London E. D.									1200 00†		175 50	1375 50	640 93
Western Exhibition			3645 00	1817 00	1683 00					1574 10	3057 46	11776 36	5459 07
Middlesex, East: ‡		420 00					10 00		1000 00		145 00	1575 00	354 03
Dorchester, North			142 75	44 50	34 50					8 00	38 15	267 90	13 20
London	37 81		128 75	16 75	8 50						44 19	236 00	
Nissouri, West			196 00	48 60	37 00					10 00	42 00	333 00	27 54
Westminster			221 00	36 25	25 50						28 85	321 60	5 85
Middlesex, West:	74 19	412 30	410 70§	106 95	131 30		21 65			27 44	308 95	1456 03	37
Caradoc			199 00‖	57 35	37 05					5 00	62 50	291 05	94 94
Delaware	18 85		50 25	36 00	50 60		4 10				43 30	203 10	
Ekfrid			54 75	20 75	24 50		50				39 89	140 39	8 08
Metcalfe			69 35	31 06	17 19					33 96		162 56	14 36
Mosa			107 25	50 25	61 50					328 60	23 68	571 28	12 57
Strathroy Horticultural				88 10			4 85			5 00	81 27	179 22	9 00

* United with County Society for Exhibition.
† United with Western Exhibition.
‡ United with Western Fair for Exhibition.
§ $37.45 of Prizes unpaid.
‖ $69.85 not paid.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Middlesex, North:	6 73	80 00	700 00		550 95			563 80		1901 48	19 21
Adelaide	19 37	88 50	45 10		5 00					157 97	
Lobo		151 50	87 10							238 60	11 25
McGillivray	12 20	69 25	37 50							118 95	
Williams, East		206 00	119 20							325 20	11 00
Williams, West	11 48	350 25	58 00		96 00				12 50	528 23	
Monck:		186 00	700 00		210 75				93 75	1190 50	
Caistor		67 00	55 55	33 00	16 30				20 00	191 85	
Canborough	44 14	70 00	59 00	25 00					2 00	200 14	
Gainsborough	3 21	56 00	49 59	50 00	21 50				3 67	183 97	
Sherbrooke and Moulton	26 94	178 00	110 00	50 00	6 12					401 06	
Pelham	36 80	84 00	71 82	28 99	15 15				13 50	250 26	
Wainfleet		58 00	42 75						27 36	128 11	9 40
Muskoka:	205 45	116 00	700 00	100 00	73 79				24 57	1219 81	
Foley	6 65	59 75	38 64		3 35				9 30	117 69	
Humphrey, Cardwell, etc.	20 78	59 00	49 68							129 46	
McDougall and Carling		37 93	55 20		9 95				2 50	105 58	
McKellar		50 00	46 00						13 05	109 05	7 05
McLean and Ridout	1 40	32 00	27 60		2 20					63 20	
Medora and Wood	16 70	55 00	46 00						80 00	118 50	
Morison and Ryde	47 94	59 50	46 92		6 35					160 71	
Stephenson	2 09	52 00	46 00	15 00	5 00		42 28			120 09	10 43
Watt	30 75	68 00	60 72	5 00	1 20					207 95	

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies. *Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Middlesex, North:		420 00	484 75	191 00	175 00	40 00	58 25				551 69	1920 69	
Adelaide			73 15	30 90	6 79		15 00				28 25	154 09	3 88
Lobo									238 60*		11 25	249 85	
McGillivray			61 75	15 25	13 50		1 75				15 50	107 75	11 20
Williams, East									325 20†		11 00	336 20	
Williams, West			107 00	35 25	52 25		1 75			226 91	56 50	479 66	48 57
Monck:	20 17	419 59	328 98	153 18	69 30					105 00	119 21	1205 43	14 93
Caistor	26 46		75 80	17 85	28 45						35 63	184 19	7 66
Canborough			94 25	37 55	16 28		1 00			1 85	16 45	167 38	32 76
Gainsborough			88 50	42 00	15 12					10 00	28 35	183 97	
Sherbrooke and Moulton			107 00	81 75	62 50						66 01	377 26	23 80
Pelham			126 89	38 73	24 56						32 01	222 19	28 07
Wainfleet			82 64	23 10	18 11						13 66	137 51	
Muskoka:		416 76	214 25	103 50	69 25					263 39	117 98	1185 13	34 68
Foley			50 75	25 75	15 00					7 50	18 69	117 69	
Humphrey, Cardwell, etc			41 50	26 75	17 60						15 68	129 46	
McDougall and Carling			32 25	32 50	16 50					4 00	20 33	105 58	
McKellar	9 00		45 60	24 25	13 25					11 20	13 40	116 10	
McLean and Ridout			26 60	16 55	7 80					2 40	6 93	60 08	3 12
Medora and Wood			25 80	38 95	16 70						18 80	100 25	18 25
Morison and Ryde			75 70	20 55	11 80					6 00	20 05	133 90	26 81
Stephenson			46 65	45 65	13 30						25 52	130 52	
Watt			74 50	38 25	15 00		6 25			45 62	14 87	194 49	13 46

* United with County Society for Exhibition.
† United with County Society for Exhibition.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Niagara E. D	129 11	130 00	350 60	130 00	17 95					757 06	
Norfolk, North:	355 10	276 00	700 00		1037 37			333 00	8 00	2709 47	
Middleton	71 49	195 00	129 00		140 11					535 60	
Townsend	160 80	229 00	139 50		269 29				9 50	808 09	
Windham	50 99	134 00	93 00		30 75					308 74	
Simcoe Horticultural		191 47	58 50		16 25				34 00	300 22	67 83
Norfolk, South *	725 48	142 50	700 00						25 85	1593 83	
Charlotteville		106 00	80 00		83 00					269 00	
Houghton	9 08	80 42	72 00						2 00	164 50	
Walsingham	26 41	124 00	125 00	115 00	104 20				4 00	498 61	
Woodhouse	24 00	80 00	80 00		5 00					189 00	
Northumberland, East:	48 05	76 00	700 00		30 00				2 95	857 00	
Brighton	125 41	100 00	86 00							311 91	
Cramahe	13 54	131 00	111 58		28 50					314 62	
Murray	35 15	128 00	103 00		33 65					299 80	
Percy	3 58	67 00			214 50					285 08	
Seymour	39 80	76 00	59 68						2 00	177 48	
Northumberland, West:	52 10	352 30	700 00		724 28			170 00		1998 63	
Alnwick		68 00	100 07		133 00					301 07	
Haldimand	20 80	72 00	94 00		72 14				11 00	269 94	
Hamilton		94 00	140 00						5 75	239 75	
Cobourg Horticultural	71 36	55 00	83 40		31 89					241 65	

* United with North District Society for Exhibition.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Niagara E. D.			248 00	218 40	70 55					13 60	117 50	668 05	89 01
Norfolk, North:		420 00	460 05	207 25	97 60					988 76	131 00	2304 66	404 81
Middleton			155 95	56 21	68 37					39 78	87 21	407 52	128 08
Townsend			261 50*	69 25	64 21		9 30			250 85	59 77	714 88	98 46
Windham			117 50	55 25	31 25					46 00	4 00	254 00	54 74
Simcoe Horticultural	22 29			227 70						35 40	82 66	368 05	
Norfolk, South:		394 50							125 00	252 30	96 05	867 85	725 98
Charlotteville	30 66		94 50	50 90	18 25					9 00	24 38	227 69	41 31
Houghton			79 50	35 60	18 50						30 90	164 50	
Walsingham			127 60	40 76	23 85					186 95	62 57	441 72	56 89
Woodhouse			87 75	33 42	9 85					1 25	25 52	157 79	31 21
Northumberland, East:		361 56	230 95	73 75	99 00						84 28	849 54	7 46
Brighton			104 10	41 05	54 15						57 90	257 20	54 71
Cramahe			93 85	31 35	48 55					4 25	122 69	300 69	13 93
Murray			152 87	36 33	49 75						36 45	275 40	24 40
Percy†										104 40	104 80	209 20	75 88
Seymour			26 60	17 50	7 95		60			7 00	69 97	129 27	48 21
Northumberland, West:		417 17	310 00	180 00	138 00					556 75	230 94	1833 16	165 52
Alnwick			88 30	36 65	34 43					56 54	41 30	271 40	29 67
Haldimand			85 75	61 50	35 25						45 91	228 41	41 53
Hamilton‡	2 58			30 00					170 00		16 50	219 08	20 67
Cobourg Horticultural				153 75						21 30	28 59	203 64	38 01

* Less by forfeits, $5.25.
† United with County Society for Exhibition.
‡ United with County Society for Exhibition.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Ontario, North:	221 22	269 00	700 00	....	484 38	....	....	....	9 00	1683 60	....
Brock	85 30	160 00	89 52	....	84 31	....	....	....	47 00	466 13	....
Mara	3 18	89 50	16 59	40 00	8 70	....	....	....	17 00	204 97	....
Reach and Scugog	19 44	196 00	81 55	....	210 55	....	....	....	....	507 54	13 48
Scott	33 26	96 00	53 96	....	57 00	....	....	....	15 00	287 22	....
Thorah	17 28	107 00	38 00	....	40 35	....	....	....	7 00	209 63	....
Uxbridge	....	192 00	110 38	....	100 83	....	....	....	....	403 21	....
Ontario, South:	42 54	908 50	700 00	....	1165 95	114 40	....	....	30 00	2961 39	....
Pickering	....	362 30	140 00	300 00	385 78	....	....	....	....	1187 08	46 36
Whitby and East Whitby	152 64	203 50	140 00	....	207 19	....	....	....	....	708 33	....
Ottawa E. D*	....	343 50	350 00	1700 00	190 00	....	....	....	....	2583 50	223 73
Oxford, North:	....	633 75	700 00	....	782 90	755 91	971 59	152 05	....	3996 18	....
Blandford	....	86 00	66 05	....	....	....	....	....	....	152 03	....
Blenheim	....	337 00	140 00	....	286 55	....	....	....	243 50	1007 05	14 78
Nissouri, East	49 40	160 00	49 40	....	....	....	....	....	....	308 80	....
Zorra, East	3 35	139 75	33 85	10 00	17 75	....	....	....	171 40	396 00	....
Zorra, West	35 62	151 00	79 52	30 00	17 82	....	....	....	4 00	317 96	....

* No Exhibition held this year, as the Provincial was in Ottawa.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, &c.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Ontario, North:		420 00*	351 50	125 25	309 00		13 00			68 06	146 00	1503 06	180 54
Brock			169 50	67 00	113 25					2 75	73 43	425 93	40 20
Mara			102 00	39 25	18 75					1 25	34 31	195 56	9 41
Reach and Scugog			332 00†	86 75	155 25		19 00			4 40	72 37	521 02	
Scott			111 50‡	51 25	29 25		14 50				42 27	248 77	38 45
Thorah			45 75	20 50	44 00					7 75	36 52	154 52	55 11
Uxbridge	3 27		141 50	43 50	98 00		41 52				44 57	372 46	30 85
Ontario, South:		280 00	977 50	371 50	459 75		32 53			72 11	696 73§	2890 12	71 27
Pickering			430 00	125 00	201 75					303 30	173 39	1233 44	
Whitby and East Whitby			254 75	118 50	168 50					53 72	29 53	625 00	78 33
Ottawa E. D.	49 25						10 50			2613 73	133 75	2807 23	
Oxford, North:	155 74	418 80	924 25	187 25	160 25					1732 73	267 24	3846 26	149 91
Blandford									152 03			152 03	
Blenheim	62 14		279 50	122 50	93 75		41 00			160 57	262 37	1021 83	
Nissouri, East			162 50	24 25	37 00						42 70	266 45	42 35
Zorra, East			163 50	64 50	47 50		9 25			23 00	55 56	363 31	32 79
Zorra, West			85 25	51 00	36 25		3 50			66 66	39 09	281 76	36 21

*Less unclaimed, $29.75.
†Unpaid, $148.75.
‡Unpaid, $15.75.
§$198.15 Note and Interest.
‖United with County Society for Exhibition.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Oxford, South	5 50	258 00	700 00			321 50		754 00	28 06	2067 06	67
Dereham		284 00	71 23		193 99				33 00	582 22	
Norwich, North		372 50	113 14		289 50				527 87	1303 01	
Norwich, South	16 39	367 00	95 21		385 00				68 40	932 00	
Oxford, East	63 93	95 00	33 50						29 43	221 86	
Peel	182 02	436 00	700 00	350 00	1580 36	98 34			30 01	3376 73	
Toronto	525 32	199 90	140 00	100 00	250 60				94 60	1310 42	
Perth, North		459 00	700 00	962 00	724 10		101 55	30 00		2976 65	
Elma	53 62	138 00	112 00		21 50				8 50	336 62	
Logan	99 34	71 50	52 00	15 00	9 07				9 37	256 28	
Mornington		345 00	108 00	26 00	21 65					300 65	44 73
Wallace and Elma	191 44	253 15	137 65	100 00	621 11					1303 35	
Stratford Horticultural	225 11	118 00	100 00	8 00	80 50					531 61	
Perth, South		109 00	700 00	212 00	429 10	97 62		69 60		1617 32	
Blanshard	131 69	215 00	110 12	53 26					3 00	540 22	
Easthope, South		57 00	40 00	20 00						117 00	
Fullarton	12 43	65 00	54 80	29 00	26 70					178 93	
Hibbert	114 75	135 00	74 40	20 00	80 05					424 20	
Mitchell Horticultural	180 03	199 50	132 20							511 73	
St. Mary's Horticultural	52 00	65 00	69 60							186 60	

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Oxford, South		420 00	724 25	183 25	130 25	25 00					584 98*	2067 73	
Dereham	5 92		149 00	62 25	46 25					170 55	138 75	572 72	9 50
Norwich, North	6 28		304 25	101 25	118 25					579 03	192 69	1301 75	1 26
Norwich, South							31 75			14 00	155 11	827 91	104 09
Oxford, East †									128 12		6 29	134 41	87 45
Peel		140 00	894 50	445 00	547 00		86 50			507 18	699 88	3320 16	56 57
Toronto			324 00	106 00	82 00		18 50			17 71	155 40	703 61	606 81
Perth, North	68 62	510 00	340 25	253 75	161 00		53 75			1042 65	257 58	2687 60	289 05
Elma			117 25	30 75	30 00		20 00			4 00	85 66	287 66	48 96
Logan			88 00‡	38 75	32 25		15 75			2 00	43 32	203 57	52 71
Mornington	35 16		142 25	50 00	59 50						58 47	345 38	
Wallace and Elma			288 05	150 75	179 50		21 25			267 55	384 39	1291 49	11 86
Stratford Horticultural				57 75			12 75		30 00	19 55	73 85	193 90	337 71
Perth, South		420 00	365 75§	122 25	181 15		39 60			191 70	338 90	1616 49	83
Blanshard			130 25	39 00	60 00		88 75				64 35	382 35	157 87
Easthope, South‖									110 00		7 00	117 00	
Fullarton			76 10	34 80	27 88						36 78	175 56	3 37
Hibbert			146 30¶	38 65	47 95		96 00			39 31	66 74	345 05	79 15
Mitchell Horticultural				180 50						144 05	141 30	465 85	45 88
St. Mary's Horticultural									115 80		10 00	125 80	60 80

* $321.50 by defalcation of Treasurer of Ingersoll and N. and W. Oxford Society.
† United with County Society for Exhibition.
‡ $16.50 unpaid.
§ $43.16 unpaid.
‖ United with East Zorra for Exhibition.
¶ $89.90 unpaid.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Peterboro', East:	19 70	70 00	700 00		246 93			100 00		1136 63	
Asphodel and Belmont	5 29	57 00	85 00							147 29	
Burleigh	36 49	91 00	115 30		8 60					251 39	
Dummer and Douro	103 64	73 00	88 70						7 86	273 20	
Galway		14 00	49 25		5 60					98 85	
Otonabee	30 46	37 00	81 30							148 76	
Peterboro', West:		86 00	696 00						139 46	949 18	
Central Exhibition	131 67	81 00			2237 92			213 81		2664 40	
Monaghan, South		50 00	129 00		23 52					202 52	23 18
Smith and Ennismore	23 60	57 00	140 00							220 60	
Peterboro', Horticultural	14 08	51 00	140 00						60	208 68	
Prescott:		80 00	700 00		91 30				29 00	900 30	
Caledonia		116 00	121 00							237 00	
Longueil and Hawkesbury		162 00	211 00							373 00	1 74
Plantagenet, South	11 40	84 00	88 00							183 10	
Prince Edward:	483 12	121 00	700 00		316 00				73 50	1693 62	
Ameliasburgh	16 00	165 00	140 00		239 45					561 05	36 01
Hallowell	23 74	50 00	60 10		16 45					149 99	
Hillier	5 22	61 00	73 30		5 00					144 52	
Marysburgh, South	3 29	59 00	62 50		26 45					151 24	14 22
Sophiasburgh	4 98	73 00	81 10		31 30					193 38	3 00

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
PETERBORO', EAST:		420 00	280 25*	115 75	114 00				21 08	17 82	131 71	1092 11	44 52
Asphodel and Belmont †							10 65		100 00		31 34	141 99	5 30
Burleigh			66 25	61 00	11 00					21 74	49 80	269 79	41 60
Dummer and Douro					8 00			159 23			50 08	217 31	55 89
Galway			25 20	12 20	7 85					5 60	10 90	61 75	37 10
Otonabee							4 80	50 00			36 75	91 55	57 21
PETERBORO', WEST: ‡		409 00							84 33	275 57	29 72	798 62	150 56
Central Exhibition			1010 50	298 25	434 50					26 41	894 74	2161 40	
Monaghan, South	17 79		107 25	35 25	39 75						25 66	225 70	
Smith and Ennismore§									21 08		18 80	39 88	180 72
Peterboro' Horticultural‖									21 08		14 49	35 57	173 11
PRESCOTT:		420 00	165 00	63 00	54 50	33 00	14 00			50 20	90 89	890 59	9 71
Caledonia				225 00							12 00	237 00	
Longueil and Hawkesbury				307 00							64 05	374 74	
Plantagenet, South			58 75	48 85	16 20						44 25	168 05	15 35
PRINCE EDWARD:		420 00	295 35	77 30	74 50		29 05			438 01	153 28	1487 49	206 13
Ameliasburgh			156 15	53 25	40 85	15 00		110 60			61 46	597 06	
Hallowell			50 20	27 15	18 10						20 50	130 95	19 04
Hillier			57 65	31 10	25 50					2 50	27 35	144 10	42
Marysburgh, South			57 75	30 83	45 44						31 44	165 46	
Sophiasburgh			103 05	31 90	27 60		4 65			6 96	22 22	196 38	

* $8.50 unpaid.
† United with County for Exhibition.
‖ United with Central Exhibition.
‡ United with Central Exhibition.
§ United with Central Exhibition.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
RENFREW, NORTH:		122 00	700 00		104 10	108 00				1034 10	
Pembroke, Stafford, etc	51 81	655 60	140 00		132 00					979 41	4 83
Ross		57 00	140 00							197 00	19 20
RENFREW, SOUTH:	56 71	134 25	700 00		200 00				11 75	1192 94	
Admaston		432 05	140 00				2 25		5 40	279 70	11 88
Grattan and Wilberforce	19 79	41 00	33 00						3 64	97 43	
McNab	109 78	71 00	107 00						1 90	289 68	
Arnprior Horticultural, etc		152 16	140 00	100 00	165 35	78 82				636 33	776 79
RUSSELL:		90 00	700 00		33 90		12 25		28 00	864 15	14 12
Clarence	9 14	68 00	64 00							141 14	
Osgoode	91 39	108 00	96 00							295 39	
Russell		217 00	210 00		5 00					432 00	
SIMCOE, EAST:		538 00	700 00	150 00	421 26				87 62	1896 88	26 69
Medonte	36 60	68 25	140 00							344 85	
Oro		214 00	140 00		2 25				5 75	392 00	31 85
Tiny and Tay	80 45	162 00	140 00	40 00	23 00		86 35		4 00	535 80	
SIMCOE, WEST:		504 40	700 00	25 00	306 05				115 35	1650 80	
Nottawasaga	101 39	209 00	140 00	40 00	188 25				16 53	695 17	
Vespra	94 65	130 00	140 00							364 65	
Barrie Horticultural	5 85	84 50	140 00	25 00	18 10				21 20	294 63	

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
RENFREW, NORTH :	33 80	280 00	160 00	65 35	95 00	37 25				75 00	213 47	959 87	74 23
Pembroke, Stafford, etc.			80 50	36 25	87 75					716 24	57 50	984 24	
Ross	10 60		79 50*	46 15	42 70						50 50	216 20	
RENFREW, SOUTH :		420 00	210 00†	79 25	98 50		1 00			292 60	84 26	1182 86	10 08
Admaston	4 40		52 40	56 56	30 00			122 01			26 21	291 58	
Grattan and Wilberforce			24 66	7 80	22 68						42 29	97 43	
McNab			74 25‡	71 50	27 60	20 00				1 20	62 25	204 18	85 50
Arnprior Horticultural, etc.	800 17		143 00	86 95	61 00							322 00	1413 12
RUSSELL :	1 82	370 00	171 45	94 15	36 85	53 00				33 90	117 10	878 27	
Clarence			55 92	28 00	7 00						29 13	120 05	21 09
Osgoode								266 00§				266 00	29 39
Russell			170 00	145 00	50 00						67 00	432 00	
SIMCOE, EAST :	1 34	420 00	585 50	178 35	154 75					404 80	178 83	1923 57	
Medonte			71 25	24 25	20 00		40 75			8 25	33 98	198 48	46 37
Oro	12 88		164 75	99 00	66 75		1 00			31 50	47 97	423 85	
Tiny and Tay			124 00	67 25	70 75	19 00	3 50			98 35	81 50	464 25	71 45
SIMCOE, WEST :	96 70	420 00	465 50	246 20	107 00		6 70			7 50	233 84	1583 44	67 36
Nottawasaga			274 00	134 50	96 50		3 00				155 63	663 63	31 54
Vespra			108 75	46 25	17 00	20 00	23 50			10 00	37 50	263 00	101 65
Barrie Horticultural				197 25						15 00	65 62	277 87	16 76

* $13.25 Prizes not paid.
† $4.75 deducted as per by-law.
‡ $52.62 deducted as per regulation.
§ For purchase and keep of Stock.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies. —*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Simcoe, South:	57 69	492 00	700 00		372 70					1622 39	
Gwillimbury, West		240 00	103 20		2 [illegible] 53				30 08	635 81	97 88
Innisfil	45 21	64 00	41 27		7 70				3 00	161 18	
Tossorontio	11 58	165 00	122 40		156 48					456 46	
Alliston Horticultural		68 00	52 45							120 45	
Stormont:	121 19	167 00	700 00		130 30				37 90	1156 39	
Finch	20 50	87 00	140 00							247 50	
Osnabruck		129 50	140 00							269 50	4 86
Toronto E. D	196 45	209 00	550 00							955 45	
Victoria, North:	53 35	98 00	700 00	200 00	41 20				40 25	1132 80	
Bexley and Carden	43 43	66 00	64 35						3 15	177 13	
Eldon	108 51	139 00	110 80		76 60					434 91	
Fenelon	2 75	80 00	75 50	20 00	19 80					198 05	
Laxton and Digby	6 27	70 00	65 25		1 75				30	143 97	
Summerville	32 87	122 00	108 10		10 60					273 57	
Victoria, South:	113 97	200 00	700 00	200 00	319 20					1533 17	
Emily	30 43	101 00	121 90		30 00					283 33	
Mariposa	18 65	149 00	140 00		145 00				19 00	471 85	
Ops	2 20	31 00	37 42							70 62	
Verulum	28 33	77 00	80 86		26 00		109 65			321 84	
Lindsay Horticultural	7 05	34 00	39 82		4 20					85 07	

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Simcoe, South		419 00	431 00	214 00	269 00		40 00			55 00	150 43	1578 43	43 96
Gwillimbury, West	96 45		240 50	108 00	171 75		1 50			21 00	94 49	733 69	
Innisfil			59 50	39 50	26 25						28 00	153 25	7 93
Tosorontio			128 50	103 00	129 25					35 00	43 45	439 20	16 26
Alliston Horticultural				47 85							36 10	83 95	36 50
Stormont		280 00	266 50	104 75	132 00		3 00			27 12	159 95	973 32	183 07
Finch			75 50	65 50	46 75		3 75			5 95	30 80	228 05	19 45
Osnabruck	21 13		112 05	36 00	58 28					12 00	34 90	274 36	
Toronto E. D*									570 00		124 58	694 58	260 87
Victoria, North		420 00	125 25	77 50	55 00	12 00	57 50			38 67	119 83	905 75	227 05
Bexley and Carden			40 00	42 25	12 25		26 00				36 60	157 10	20 03
Eldon			72 00	38 00	50 65					109 59	54 50	324 74	110 17
Fenelon			67 25	38 10	14 75		36 00			5 00		161 10	36 95
Laxton and Digby			53 10	19 00	15 00		1 25			14 05	35 75	138 15	5 82
Summerville			63 95†	51 60	38 10		3 90			15 00	26 43	185 08	88 49
Victoria, South		420 00	293 75	118 25	83 75		8 25			145 56	179 76	1249 32	283 85
Emily			83 60	52 75	67 50					18 54	51 00	272 79	10 54
Mariposa			170 00	54 00	82 75					44 00	80 78	431 53	40 32
Ops‡									25 00		45 50	70 50	12
Verulum			72 [illegible]	41 70	22 75		5 00	109 65		2 13	22 00	275 78	46 06
Lindsay Horticultural				35 25						4 00	29 49	68 74	16 33

* United with the Toronto Industrial Exhibition.
† $13.90 unpaid.
‡ United with County Society.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
WATERLOO, NORTH:	677 05	241 00	700 00	200 00	350 00	.....	.....	.....	29 00	2197 05	.....
Wellesley	78 46	180 00	140 00	40 00	28 85	.....	.....	.....	19 18	486 49	.....
Woolwich	.....	338 00	140 00	20 00	4 45	.....	.....	.....	.....	502 45	64 49
Berlin Horticultural	70 08	69 00	78 75	25 00	37 45	.....	.....	.....	.....	280 28	.....
WATERLOO, SOUTH:	132 44	240 00	700 00	235 00	467 30	.....	.....	.....	73 00	1847 74	.....
Wilmot	165 92	272 00	140 00	50 00	131 70	.....	.....	.....	149 50	909 12	.....
Preston Horticultural	114 54	89 00	140 00	30 00	72 00	.....	.....	.....	.....	445 54	.....
WELLAND:	291 68	208 00	700 00	100 00	521 50	.....	.....	.....	55 50	1879 68	.....
Bertie	9 73	84 00	59 07	.....	9 60	.....	.....	.....	.....	162 40	9 09
Crowland	22 30	73 00	50 96	.....	.....	.....	.....	.....	.....	146 26	.....
Humberstone	.....	76 00	45 55	10 00	.....	.....	.....	.....	6 50	138 05	.....
Stamford	40 57	129 00	110 18	40 00	.....	.....	7 00	.....	40	327 15	.....
Thorold	.....	165 25	112 42	50 00	.....	.....	.....	.....	38 00	355 67	.....
Willoughby	46 57	57 00	40 67	.....	.....	.....	.....	.....	2 25	146 49	.....
WELLINGTON, WEST:	250 77	100 00	700 00	200 00	233 70	.....	.....	.....	25 00	1509 47	.....
Arthur	14 34	159 00	90 00	25 00	23 95	.....	.....	.....	12 00	324 29	.....
Minto	15 73	131 50	78 60	.....	202 40	.....	.....	.....	602 30	1030 53	30 68
Peel and Maryburg	31 26	108 00	64 80	.....	15 70	.....	.....	.....	25 25	245 01	55 01
Clifford Horticultural	14 84	223 20	89 40	.....	38 95	.....	.....	.....	.....	366 39	.....
Drayton Horticultural	.....	53 00	30 60	.....	4 00	.....	.....	.....	.....	87 60	.....
Mount Forest Horticultural	483 62	121 00	72 00	.....	.....	.....	.....	.....	.....	677 22	.....

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Waterloo, North		358 75	611 00	244 75	211 50						450 67	1876 67	320 38
Wellesley			194 00	75 50	69 50					1 30	70 79	411 09	75 40
Woolwich	24 00		349 15	51 50	49 50		4 00				88 79	566 94	
Berlin Horticultural				162 25	22 25						87 66	272 16	8 12
Waterloo, South		280 00	590 50	155 60	94 50					174 75	310 25	1605 60	242 14
Wilmot			358 75	123 50	111 25					22 30	103 23	749 03	160 09
Preston Horticultural				129 75						34 58	85 84	250 17	195 37
Welland		420 00	485 44	138 64	164 14		21 00			66 59	133 65	1429 46	450 22
Bertie			79 60	18 70	34 40					10 00	28 79	171 49	
Crowland			79 15	17 85	12 10						23 46	132 56	13 70
Humberstone			58 35	23 22	32 28						18 51	137 42	63
Stamford			191 75	57 10	20 10						28 61	297 56	29 59
Thorold	8 10		178 82	44 63	18 97		12 66				51 43	306 51	49 16
Willoughby			95 25	20 98	12 43						16 37	145 03	1 46
Wellington, West		420 00	223 75	93 00	95 25		9 00			147 00	287 44	1275 44	234 03
Arthur			113 75	68 50	41 00					10 61	73 11	306 97	17 32
Minto			91 75	61 35	34 36		28 00			801 75	44 00	1061 21	
Peel and Maryburg			189 25	48 75	19 00					5 00	38 02	300 02	
Clifford Horticultural			102 75	68 15	42 50		1 50			40 49	82 51	337 90	28 49
Drayton Horticultural				56 25							16 35	72 60	15 00
Mount Forest Horticultural							4 00			545 40	9 20	558 60	118 62

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Wellington, Centre:	53 25	87 50	700 00	200 00	56 [illegible]5	.. ....	.....	98 40	42 90	1238 40	... .
Erin	175 55	293 50	129 82	.....	363 85	.....	.....	... ..	....	963 72	.....
Garafraxa, West	151 25	78 62	.....	.....	20 05	.....	.....	.....	.....	229 92	....
Luther	.....	85 00	31 73	20 00	9 50	.....	.....	.....	4 00	150 23	....
Nichol	5 65	63 00	40 00	.....	.....	.....	.....	... .	....	108 65	.....
Pilkinton	.....	63 00	. .....	.....	.....	.....	.....	.....	.....	63 00	... . .
Elora Horticultural	.....	80 00	39 15	.....	26 20	.....	.....	.....	5 54	160 90	....
Fergus Horticultural	81 76	84 50	50 90	.....	43 95	.....	.....	....	....	263 61	.....
Wellington, South:	.....	732 50	700 00	600 00	4793 69	.....	... .	241 50	1370 25	8437 94	365 93
Eramosa	.....	585 00	93 28	80 00	85 00	.....	.....	....	20 00	868 28	.....
Guelph	2 85	221 50	....	.. ....	.....	.....	.....	....	20 00	244 35	35
Puslinch	32 31	315 50	172 77	.....	.....	....	.....	... .	5 93	486 51	.....
Guelph Horticultural	13 50	115 00	61 25	.....	20 85	.....	.....	.....	18 50	229 10	... .
Wentworth, North:	555 30	104 00	700 00	200 00	....	....	....	... .	264 24	1823 54	.....
Beverly	93 26	320 50	140 00	40 00	146 34	.....	....	.....	140 50	880 60	....
Flamboro' East	10 75	189 50	100 00	50 00	30 80	....	... .	.....	....	381 05	....
Flamboro' West	....	176 00	97 00	35 00	12 15	.....	....	....	....	320 15	.....

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Continued.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
WELLINGTON, CENTRE:	. . .	339 98	319 50	182 00	147 00	.....	58 50	.....	.....	.....	184 43	1231 41	6 99
Erin	.....	.....	249 75	116 25	114 30	5 00	.....	.....	.....	205 57	112 16	803 03	160 69
Garafraxa, West	1 65	.....	55 00	64 00	34 75	.....	.....	.....	.....	2 50	72 07	229 92	.....
Luther	.....	.....	57 50	33 75	30 75	.....	.....	.....	.....	.....	28 03	150 03	20
Nichol *	.....	.....	.....	.....	.....	.....	.....	.....	103 00	.....	.....	103 00	5 65
Pilkinton †	10	.....	.....	.....	.....	.....	.....	.....	45 40	.....	17 50	63 00	.....
Elora Horticultural	4 85	.....	.....	118 00	.....	.....	.....	.....	.....	.....	38 05	160 90	.....
Fergus Horticultural	.....	.....	.....	135 00	.....	.....	.....	.....	.....	7 48	100 80	243 28	20 33
WELLINGTON, SOUTH:	157 83	292 30‡	2180 50	1088 00	1567 00	.....	96 00	.....	.....	57 25	3475 99§	8803 87	.....
Eramosa	5 13	.....	167 76	68 06	38 80	.....	30 30	.....	.....	473 43	66 69	850 17	18 11
Guelph ‖	.....	.....	.....	.....	.....	.....	.....	.....	241 50	.....	3 20	244 70	.....
Puslinch	.....	.....	170 00	100 00	46 50	.....	.....	.....	.....	.....	105 36	421 86	64 65
Guelph Horticultural	.....	.....	.....	153 25¶	.....	.....	.....	.....	.....	.....	63 00	196 00	33 10
WENTWORTH, NORTH: **	.....	337 00	.....	.....	.....	.....	.....	.....	1150 00	.....	42 65	1529 65	293 89
Beverly	.....	.....	291 75	174 25	117 25	.....	15 25	.....	.....	48 67	146 03	794 20	86 40
Flamboro', East	.....	.....	161 50	92 50	28 50	.....	.....	.....	.....	7 00	46 79	336 29	44 76
Flamboro', West	9 90	.....	69 00	58 00	20 25	.....	2 50	.....	.....	.....	147 56	307 21	12 94

* United with County Society for Exhibition.
† United with County Exhibition.
‡‡ $111.00 Prizes unpaid.
§ Including expenses of Vice-Royal reception and other special items.
‖ United with County Show.
¶ $20.25 unpaid.
** United with Great Central Exhibition, see HAMILTON.

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Concluded.*

RECEIPTS FOR THE YEAR 1879.

SOCIETIES.	Balances in hand.	Subscriptions and Donations.	Legislative Grants.	Municipal Grants.	Rents of and Admissions to Grounds.	Moneys on Loan.	Sale of Machinery, Stock, Seeds, etc.	From other Societies for Amalgamation.	Miscellaneous Receipts.	Totals of Receipts.	Balances due Treasurer
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Wentworth, South	547 58	180 00	700 00	200 00					285 19	1912 77	
Ancaster		152 00	140 00	50 00	38 00				57 50	437 50	33 90
Barton and Glanford	21 16	128 00	134 40	60 00	5 90					349 46	
Saltfleet and Binbrook	105 60	111 00	116 00	65 00	26 65					424 25	
York, North	54 01	432 25	700 00	150 00	953 85				7 92	2298 03	
Georgina and North Gwillimbury		131 00	110 70	23 37	14 10				22 25	301 42	
Gwillimbury, East		150 00	135 00	28 50						313 50	
King	111 80	129 00	90 00	19 00	224 60				66 00	640 40	
Whitchurch	285 33	219 00	83 70	17 67	192 20				29 00	826 90	
York, West	328 84	256 00	700 00	125 00				60 00		1469 84	
Etobicoke		428 00	165 00	80 60	171 55				12 50	857 05	
Vaughan	144 12	149 00	140 00	75 00	894 00				254 40*	1656 52	
York, East	464 58	1018 00	591 00	125 00	1047 69			355 71	55 50	3657 48	
Markham	561 74	92 00							30 50	684 24	
Scarboro'	299 93	178 00	118 20	25 00	172 50				12 50	906 13	

*Received from County Society in settlement

ANALYSIS of Reports of County and Township Agricultural Societies, and of Horticultural Societies.—*Concluded.*

EXPENDITURES FOR THE YEAR 1879.

SOCIETIES.	Balances due Treasurers.	Legislative Grants to Township Societies.	Prizes for Animals.	Prizes for Field, Garden, and Dairy Products.	Prizes for Manufactures, Fine Arts, and Ladies' Work.	Prizes for Ploughing.	Prizes for previous years paid.	Purchase of Machinery, Stock, Seeds, etc.	Grants to Union Exhibitions.	Buildings and Grounds, Interest & Insurance.	Working and Miscellaneous Expenses.	Totals of Expenditure.	Balances in hand.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
WENTWORTH, SOUTH:*	.....	390 88	.....	.....	.....	50 00	.....	.....	1193 57	.....	65 43	1699 88	212 89
Ancaster	34 85	.....	193 75	122 00	48 75	.....	.....	.....	.....	5 00	67 05	471 40	.....
Barton and Glanford	.....	.....	131 50	65 25	21 60	.....	.....	.....	.....	2 00	56 15	276 50	72 96
Saltfleet and Binbrook	.....	.....	190 75	81 75	30 25	.....	1 00	.....	.....	.....	90 96	394 71	29 54
YORK, NORTH:	.....	507 94	557 50	210 25	308 23	.....	15 50	.....	.....	399 08	195 32	2193 82	104 21
Georgina and North Gwillimbury	.....	.....	140 75	54 00	28 25	.....	10 00	.....	.....	1 00	48 50	282 50	18 92
Gwillimbury, East	.....	.....	119 50	48 00	44 50	.....	2 85	.....	.....	.....	62 59	277 44	36 06
King	.....	.....	266 20	62 75	98 55	.....	.....	.....	.....	6 00	104 75	538 25	102 15
Whitchurch	.....	.....	217 00	146 00	93 00	.....	1 00	.....	.....	20 00	91 01	568 01	258 89
YORK, WEST:	.....	280 00	100 00	29 00	.....	.....	144 60	.....	.....	.....	486 54†	1039 54	430 34
Etobicoke	12 97	.....	308 00	230 50	131 00	.....	7 00	.....	.....	31 05	95 14	815 66	41 39
Vaughan	.....	.....	408 00	195 50	220 00	.....	3 60	.....	.....	37 50	355 85‡	1219 85	436 67
YORK, EAST:	.....	358 00	1193 00	405 00	519 50	341 00	.....	.....	.....	175 92	518 35	3510 77	146 71
Markham§	.....	.....	.....	.....	.....	.....	.....	.....	121 00	315 00	42 00	478 00	206 24
Scarboro'	.....	.....	266 50	114 00	103 00	.....	.....	.....	.....	28 74	121 03	633 27	272 86

* United with Great Central Exhibition.
† $35.00 was paid as balance to Vaughan Society for Fall Exhibition.
‡ $60.00 for Spring County Show.
§ United with County for Exhibition.

APPENDIX TO REPORT

OF THE

Commissioner of Agriculture and Arts.

APPENDIX (B).

REPORT OF THE COUNCIL OF THE AGRICULTURAL AND ARTS ASSOCIATION OF ONTARIO FOR 1880.

PROVINCIAL EXHIBITION OF 1880.

OFFICE OF THE AGRICULTURAL AND ARTS
ASSOCIATION OF ONTARIO,
TORONTO, November, 1880.

To the Hon. S. C. WOOD,
Commissioner of Agriculture, &c., &c.

SIR,—I have the honour, on behalf of the Agricultural and Arts Association of Ontario, to present the following report of the results of the Provincial Exhibition held at Hamilton, as required by statute, showing the progress made in the respective departments, as compared with the Exhibitions of previous years.

The Exhibition commenced on the 20th September, and continued two weeks, which was in accordance with a resolution unanimously adopted at the Annual Meeting of the Directors of the Association, held at Ottawa in 1879.

All exhibits, except live stock and dairy products, were on the grounds the first week, and prizes in the various departments were awarded by the Judges.

His Excellency the Governor-General formally opened the Exhibition on Friday, the 24th September, and was presented by the President of the Council with the following address:—

To His Excellency the RIGHT HON. SIR JOHN DOUGLAS SUTHERLAND CAMPBELL, Marquis of Lorne, one of Her Majesty's Most Honourable Privy Council, Knight of the Most Ancient and Most Noble Order of the Thistle, Knight Grand Cross of the Most Distinguished Order of St. Michael and St George, Governor-General of the Dominion of Canada, and Vice-Admiral of the same, etc.

May it please your Excellency, we, the President and Directors of the Agricultural and Arts Association of Ontario, again welcome you to the annual gathering of the farmers, mechanics, and citizens of Ontario.

Although but one year has elapsed since you honoured us with your presence, we believe that in that short period you will have observed the wonderful increase in the productions of the soil, affording abundant evidence of the great usefulness of our Association.

These annual exhibitions, encouraged, as they have been, by your predecessors as well as yourself, have done much to develop the agricultural and mechanical resources of the Dominion; and we have every reason to believe, from the great interest you have always taken, both in the mother country and since your arrival here, in promoting these important pursuits, that they will continue to receive your patronage, which in itself will prove an incentive to those connected with this Association to still further persevere in the noble work which they have undertaken.

We had fondly hoped that Her Royal Highness the Princess Louise would again have honoured us with her presence; and we can assure you that it was with the most profound feelings of regret that we learned the cause, which alone, we are assured, prevented her joining with your Excellency in the opening of the Exhibition; and we, in common with every citizen in the Dominion, devoutly pray that Her Royal Highness may be speedily restored to her wonted health, and may soon be enabled to grace with her presence the vice-regal home at the capital.

J. C. Rykert, *President.*
Jno. R. Craig, *Secretary.*

September 24, 1880.

His Excellency made the following reply :—

Gentlemen of the Agricultural and Arts Association of Ontario:

Believe me that any service which I can render to your invaluable Association will always be at your command, and you may be sure that it is the desire of the Princess always to join me in such endeavours. It must at the same time be remembered that ladies have not that iron constitution, which it is necessary that an official should possess, and it is not always possible for them to be present as well in the body as in the spirit. I congratulate you on the great progress visible in the manufactures exhibited, and on having the Provincial Show held this year at Hamilton. In Ontario, where the science of agriculture is beginning to be so thoroughly understood, I fear I can say but little that may be of use to you, but I cannot too pointedly praise that most prudent of all speculations which has made several of the gentlemen who lead the way in such matters purchase some of the best of British cattle. To be content with raising inferior stock is as unfortunate in economy as it is an illiberal and unscientific treatment of the land. Great as are the advantages possessed in this country by the new soil, which has comparatively recently been broken up, yet the effects of unscientific farming are necessarily to be seen in many places, and it is quite as much an object of our agricultural exhibitions to point out defects of this nature as it is to display the triumphs of those who, pursuing agriculture upon a wiser plan, can year after year show the superiority of a scientific and liberal culture of the land. I have no doubt that much good will result from the advice given in the report which will be issued by the Agricultural Commission now sitting in this Province. There is much upon which you may be congratulated. The great increase in the number of horses raised here is meeting the demand for them—the growth of the cheese manufacture under the factory system—the increased attention given to root growing in connection with cattle feeding—the care bestowed on more general underdraining—the development of fruit and vine culture, and the excellence and cheapness of your agricultural implements, are all features upon which we may dwell with the utmost satisfaction. Your pasture lands are so wide, and the facilities afforded by the

country for the raising of stock are so great, that it will be your own fault if you allow any others, be they breeders in the old country or the United States, to take the wind too much out of your sails. It is to be desired that provision be made against bad usage of the meat sent to England, for sufficient care is not taken of it at present after debarkation; and it appears to disadvantage in consequence in the markets. It must be remembered that at the present moment you have advantages with regard to the protection afforded you in the permission given to land your cattle alive in the old country, when it is denied to the States, which cannot be expected to last. It is impossible to urge too strongly the necessity of preparation against a time when American cattle will be again admitted alive into England. Unless you get the very best stock, and produce high graded beasts, you cannot hold your own. The necessary expense attending the purchase of high bred cattle will now pay you, and if with their produce you can maintain your place in the European markets you may be assured that the money so spent could never have been spent to better purpose. I am informed that lately at Toronto—and I hope we may see the same feature here in two days—Galloways, Polled Angus, as well as good Shorthorns, were to be seen in the yards. In sheep, also, some of the gentlemen who, with so much foresight, lead the way amongst our agricultural communities have made purchases this year of Shropshire and other high class animals. I trust that each year may see a marked improvement with respect to following such leaders, and I have the utmost confidence that with the spirit of enterprise which has made British North America proportionately equal to any area on this continent in population, and in all the arts which can lead to that population's prosperity and happiness, Canada will not be found to be one whit behind hand.

LORNE.

Three hearty cheers were then given for His Excellency and the Princess, and the party proceeded to

VISIT THE MAIN BUILDING.

His Excellency, accompanied by his suite, passed through the building, and appeared highly pleased with the exhibit.

The next visit was to

THE HORTICULTURAL BUILDING.

and here some time was spent, the magnificent display of fruit attracting great attention. His Excellency appeared greatly interested in the display of native wines.

To the second week of the Exhibition was added live stock and dairy produce.

His Honour the Lieutenant-Governor of Ontario, and several Members of the Provincial Government, visited the grounds.

The entire number of entries in all classes was 12,252, being an increase of 1,141 over the Exhibition of 1876 in the same place, and 1,584 over the last Exhibition, held in Ottawa in 1879.

The amount offered in prizes was $16,994 against $18,237 in Ottawa in 1879, which includes a special grant from the Dominion Government of $2,450; $17,947 at Toronto, in 1878; $16,320 at London, in 1877; and $18,237 at Hamilton, in 1876.

The following is a statement showing the amount of competition in the several leading classes, as compared with the four previous Exhibitions:

Horses.—In all classes there were 740 entries against 492 in Ottawa, in 1879; 816 in Toronto, in 1878; 1,075 in London, in 1877; and 928 in Hamilton, in 1876.

There were several recent importations of pure-bred Clydesdales from Scotland, of high order of merit.

Cattle.—The total number was 326 against 618 in Ottawa, in 1879; 640 in Toronto, in 1878; 591 in London, in 1877; and 484 in Hamilton, in 1876.

In consequence of the Government restrictions, prohibiting importation of cattle, unless subject to three months' quarantine, there were no cattle of recent importation exhibited; yet the character of the herds of the different breeds was fully equal to that of any previous year; it was also gratifying to observe that a greater proportion of the cattle were bred by the exhibitors themselves.

There was a superior exhibit of fat cattle, nearly all of which were sold at high prices for the British market.

Sheep.—Of all kinds there were 675 against 659 in Toronto, in 1878; 859 in London, in 1877; and 887 in Hamilton, in 1876.

The show of sheep was exceedingly good, especially in Southdowns, Shropshire Downs, and Oxford Downs, far excelling any former Exhibition.

Swine.—In this class there were 407 entries against 355 in 1879; 471 in 1878; 532 in 1877; and 230 in 1876.

Poultry.—Total number of entries were 821 against 460 in 1879; 821 in 1878; 847 in 1877; and 895 in 1876.

Implements.—In agricultural machinery, implements and tools, there were 370 entries against 470 in 1879; 588 in 1878; 633 in 1877; and 430 in 1876.

Great attention has been bestowed by manufacturers of reaping machines during the past year in the introduction of *self-binders*; there were four different inventions on exhibition, each of which were considered worthy of commendation, and were awarded a silver medal.

Agricultural Products.—In this department, consisting of grains and seeds, field roots, dairy produce, honey, and domestic wines, there were 1,310 entries against 1,492 in 1879; 917 in 1878; 1,393 in 1877; and 1,119 in 1876.

The dairy products were pronounced by the judges to be the largest and best in quality which have been heretofore exhibited. The great success in this department is mainly due to the active co-operation of the Eastern and Western Dairymen's Associations of Ontario, in contributing liberally of their funds, enabling the Council to offer the large amount of $1,000 in premiums.

Horticultural Products.—In this department there were 3,999 entries against 2,252 in 1879; 3,223 in 1878; 2,123 in 1877; and 2,150 in 1876.

Hamilton, being in the centre of the finest fruit growing district of the Province, and the season being favourable for the growth of fruit, an unusually good exhibit in this department was the result.

Arts and Manufactures.—In this department consisting of fine arts, ladies' work, chemical manufactures, printing, musical instruments, building materials, cabinet ware, carriages and sleighs, wearing apparel, woollen goods, groceries and provisions, machinery, etc., etc., there were 2,571 entries against 2,902 in 1879; 3,110 in 1878; 2,567 in 1877; and 2,768 in 1876.

I beg to refer to a subjoined table showing the amount offered in prizes, the amount awarded, and the number of entries in each class at the late Exhibition; also the number of entries in each class in each of the four preceding years.

Annual Meeting.

The thirty-fifth Annual Meeting of the Agricultural and Arts Association of the Province of Ontario was held in the Court House, City of Hamilton, on the evening of September 29th—the President, J. C. Rykert, M.P., in the chair.

Amongst those present were :—

Members of the Council.—District No. 1, D. P. McKinnon, South Finch; District No. 2, Ira Morgan, Osgoode; District No. 3, Joshua Legge, Jr., Gananoque; District No. 4, J. B. Aylesworth, Newburgh; District No. 5, John Carnegie, Peterboro'; District No. 6, George Graham, Brampton; District No. 7, G. Moore, Waterloo; District No. 9, Hon. D. Christie, Paris; District No. 10, William Roy, Owen Sound; District No. 11, L. E. Shipley, Greystead; District No. 12, Stephen White, Charing Cross; District No. 13, Charles Drury, Crown Hill.

Ex-officio Members.—Hon. S. C. Wood, Commissioner of Agriculture, etc., Toronto; James Young, M.P.P., Galt, President of the Mechanics' Institutes' Association of Ontario; Otto Klotz, Preston, Vice-President of the Mechanics' Institutes' Association of Ontario; David McCrae, Elected Member of the Mechanics' Institutes' Association of Ontario; C. Dempsey, President of the Fruit Growers' Association; William Saunders, President of the Entomological Society, London; K. Graham, Belleville, President of the Dairymen's Association of Eastern Ontario; E. Caswell, Ingersoll, President of the Dairymen's Association of Western Ontario; James Mills, Principal of Ontario School of Agriculture, Guelph; William Brown, Professor Ontario School of Agriculture, Guelph.

Ex-Presidents.—Messrs. F. W. Stone, Thomas Stock, S. Wilmot.

Delegates from Agricultural Societies.—W. G. Hingston, East Huron; James Tolton, South Bruce; John McClurg, Joseph Rosser, North Middlesex; John McPherson, West Middlesex; Wm. Eadie, William Guy, Russell; Wm. Carruthers, John Pratt, West Northumberland; Alex. Servos, Robert Shearer, Niagara; John Crawford, Alfred Mason, East York; Wm. Young, Humphrey Snell, West Huron; W. H. Pardo, John Paxton, West Kent; David Johnson, Donald Douglas, East Northumberland; James Sutherland, W. McLeod, Stormont; Thomas Hamilton, Dundas; John Lee, East Kent; Jas. Jackson, Luther Cheyne, Peel; Jos. B. Pearce, Chas. O'Reilly, East Peterboro'; Samuel Wood, Alex. K. McDonnell, Cornwall; E. Jackson, North York; Joseph Salkeld, North Perth; Oliver D. Cowan, W. A. Webster, South Leeds; J. B. Bessey, Henry Robinson, Halton; Jacob Gainer, J. K. Crawford, Welland; Peter Rennie, David Foote, Centre Wellington; Peter Bristol, John Sharp, Lennox; James Thorndike, South Victoria; R. S. Patterson, West Hastings; Andrew Smith, V.S., W. H. Doel, Toronto; James Millar, South Grenville; James Russell, Robert Auld, East Lambton; E. C. Carpenter, J. T. Murphy, North Norfolk; Peter McEwen, North Leeds and Grenville; John McKellar, John Crawford, Ottawa; A. R. McGregor, Wm. Mowbray, West Lambton; Wm. Donaldson, North Oxford; John Cowan, Prince Edward; Richard Whetter, George Douglass, East Middlesex; Daniel Burt, C. Oneaill, North Brant; Joseph Dunkin, South Norfolk; Angus McBean, Walter Idington, South Waterloo; William Tripp, South Oxford; George Murton, M. Sweetnam, South Wellington; Hugh Crawford, John Jackson, Monck; Robert Deverell, John D. Howden, South Ontario; Edward Jeffs, John Ross, South Simcoe; Anson Aylesworth, R. Nugent, Addington; Hugh Love, South Huron; J. S. Caesar, V.S., Col. A. T. H Williams, East Durham; Joseph Cline, W. M. Calder, South Wentworth; James Campbell, Joseph Walter, West Peterboro'; Roger Headley, South Perth; T. Attridge, James Black, North Wentworth.

Delegates from Horticultural Societies.—D. W. Beadle, Lincoln; John Thompson, North Grey; James Vine, William McLaren, East Hastings; F. W. Wood, Sarnia; Peter Barnman, Preston; J. B. Hay, Brantford; Alex. McD. Allan, Goderich; Charles Scott, Robert Anderson, Orangeville; T. Partridge, John Plummer, London; Dr. Henderson, Strathroy; D. R. Dobier, Owen Sound; A. Munro, Glengarry; Geo. Leslie, Jr., Toronto; J. M. Lottridge, A. E. Carpenter, Hamilton.

Mechanics' Institutes.—Alex. Williams, Woodbridge; A. K. Scholfield, Port Colborne; Thomas Tilt, Waterloo; Henry Wade, Port Hope; John Smith, Claude; David Stock, Dr. McGregor, Waterdown; H. W. Peterson, Waterloo; John G. Watson, Ayr.

Judge Sinclair, Mr. Thomas Robertson, Q.C., M.P., Mr. Geo. Roach and others, were likewise present. Mr. J. R. Craig acted as Secretary.

After the calling of the roll of members, 300 of whom answered to their names, the President read the following address:—

ADDRESS.

Gentlemen,—After the lapse of fifteen years, it is again my privilege, as the head of the Agricultural and Arts Association of Ontario, to address you on those subjects which are more intimately connected with agriculture. It is with the greatest satisfaction, but at the same time with amazement, that I have witnessed during that period the wonderful and rapid strides which have been made in the development of the agricultural and manufaturing resources of the country. Everywhere is to be seen unlimited evidence of the

industry of our agriculturists and the inventive genius of our mechanics. To those, like myself, who have been connected with this Association for over a quarter of a century, and who have seen the agricultural interests in their infancy, and who have watched the wonderful effect which the generous rivalry created by these agricultural societies has had in popularizing the pursuit of agriculture, it is indeed a source of gratification, and has more than rewarded us for the time devoted to this work. The great extent of the Exhibition, and its yearly increase, having rendered it impossible to satisfy the general public in the limited time which had heretofore been allotted to it, a resolution was passed at the last Annual Meeting in favour of holding the same for two weeks. I think, however, it would be advisable to open the Exhibition in the future on Wednesday and close the same on Thursday of the following week. This would enable the exhibitors to attend and return without interfering with the Sabbath. In every department there has been a largely increased number of exhibitors, and the general excellence of the articles exhibited affords the strongest evidence of the increased interest taken in the Exhibition by those whose duty it is to develop the agricultural and mechanical interests of the country.

From a financial point of view the present Exhibition has not been so successful as was anticipated, mainly, if not altogether, on account of the illiberality and want of public spirit on the part of the managers of the several railways. The conduct of the manager of the Great Western Railway, whose action, I am informed, decided that of other companies, has appeared in marked contrast with that of his predecessors, who invariably aided to their utmost in accommodating the general public. It seems impossible to understand the apparent indifference of that official to the interests of the Canadian people. His uncourteous conduct towards the large and influential delegation which waited on him with a view to having the fares reduced was not calculated to popularize his railway. He may yet be taught to know that even railway managers are amenable to public opinion. Civility has always been a cheap and useful commodity in this country, and the possession of a moderate amount of it might be found beneficial, even to so important a person as a railway manager.

In the department of mechanical implements there has been a very large increase, exhibiting many improvements upon valuable implements and machines already in use; also a very large number of new and useful machines, showing that the enterprise of our mechanics is keeping pace with the increasing necessity for labour-saving machinery. And I think the Association has great cause to feel gratified that year after year has shown a steady and large increase in this most important department.

The magnificent exhibition of agricultural and horticultural productions bears testimony to the abundant harvest with which we have again been blessed, and the excellence of the several articles exhibited leaves no room to doubt that increased interest is being taken in developing the agricultural resources of the country.

It is with pleasure I have also to notice the wonderful display in the dairy department, which is fast becoming one of the most important industries in Ontario. To those gentlemen who have devoted so much time and thought in developing this new branch of industry we are under the greatest obligations. No one class of people has done more to bring this country into notice throughout Britain and the Continent than those connected with dairy interests.

It can hardly be expected that I shall be able, in the limited time which must necessarily be occupied by the annual address, to do more than discuss briefly some few of the various subjects that may be of interest to those connected with this Association, and to offer such practical suggestions as may be of benefit to those engaged in the noble pursuit of agriculture.

The importance of these Agricultural Associations is daily becoming more evident, and I think I am safe in asserting that, so far as this Province is concerned, its ability to maintain itself in the foremost rank of agricultural communities is largely due to the influence of these societies, brought to bear upon the people by their annual Fairs, and by the opportunities they afford to the people of witnessing the improved system of agriculture. These annual Exhibitions have been the means of popularizing the science of agriculture, and of convincing the rising generation that the practice of farming is one of the most ennobling of pursuits.

It is now a profession calling to its aid science and the mechanical arts, and in its every branch the inventive genius of man. The farmer now, instead of merely following the beaten track of his ancestor, brings to his pursuit his own power of inquiry and of investigation. Chemistry teaches him the nature and quality of the ingredients composing his soil, the species of crop suitable to its productive power, and the kinds of manure he must use, and the proportion of cattle he must keep to make his farm productive. As he acquires a knowledge of chemistry and agricultural geology, and of the physiology of plants and animals, his crops become more certain and his reward more sure. Armed with knowledge, the fertility of man's mind has discovered remedies for the sterility of soils, and found means for guarding the fruits of his labour even against the vicissitudes of climate. I know there has been a disposition in the minds of a large portion of the community to undervalue the farming interest, and the idea has to some extent pervaded the minds of farmers themselves, that this occupation is not so respectable or so honourable as some other calling. I am happy to believe that the true position of the agriculturist, among the other callings and pursuits of our citizens, is becoming better understood and appreciated in the community than it has hitherto been. Farmers themselves are beginning to awake to a sense of the position they occupy in society, and to the dignity of their calling. It is now generally acknowledged that the prosperity of agriculture is indispensable to general prosperity. It is the great moving power of human existence. There has, unfortunately, been a disposition among farmers themselves to undervalue the many advantages which they enjoy, and to consider the labour of conducting the operation of the farm as a kind of drudgery. But if that be drudgery, what shall we call the daily labour of the mechanic, or the dull routine of the merchant, or what the confinement of the law office or the counting-room? The farmer, while cultivating the soil, breathes the pure air of heaven in the school-room of nature, and, if an apt scholar, he will study her ways, profit by her example, and be led to the consideration of the beauties which she is continually presenting before him. The true farmer finds not only employment for his physical powers, but for his mental faculties, and by studying nature he practically becomes a natural philosopher.

I hold it to be the duty of every good citizen to teach the youth of our country that the art of agriculture has about all the elements which serve to make it an honourable profession. There is nothing in the legitimate pursuits of agriculture that is in any respect unintellectual or debasing, nor is there anything in it to prevent the upright and intelligent farmer from enjoying, and if need be expressing, the conscientious conviction that his life is as honourable as his neighbour's, be that neighbour who he may. Other pursuits may have more of the fancy, agriculture the realities. It may be said with entire truth, with reference to our own people, that the wider and the broader the field of agricultural labour is made, the more general and extensive the employment of our citizens in agricultural pursuits, just in that proportion will the substantial interests of the country be promoted. On the other hand, just in proportion as you desert your agricultural field, allow noxious weeds to take the place of rich meadows and growing crops, flock into your cities, and engage in the exciting but unprofitable pursuits of speculation, in that same proportion will the country suffer the devastating consequences. There have been times, and they have occurred more than once in the recollection of many of us, when the intoxicating excitement of wild and visionary speculation—the hopes of speedy fortunes—the unnatural and greedy desire for gain, to be acquired without labour and spent with little judgment, have induced many to quit the sober and peaceful pursuit of agriculture—induced them to leave their fruitful farms and happy homes for scenes of unnatural excitement, where trade was feverish and the pulse of business dangerously high and rapid, where capital was fictitious and credit unbounded, where fortunes could be made in a day, and wealth become the plaything of an hour.

We can learn a lesson from the past that may teach us a surer and safer path for the future. Let not agricultural pursuits be either despised or neglected. Their advantages can scarcely be appreciated, and the more we reflect upon it, the more information and experience we obtain, the firmer will be our conviction that agriculture is not only one of the noblest, but also one of the most useful of the arts.

It must be borne in mind that success in agricultural pursuits depends largely upon the knowledge of the principles of agriculture and the laws of organic life. No business in which man can engage—not even the professions of medicine, divinity, or law—is more dependent for success upon deep and extensive learning, yet none has derived so little benefit from the great discoveries of the age as the business of farming; and while no class of men so much need, from their isolated situation and few social advantages, the refining, liberalizing, and ennobling influences of education, none really obtain so little. No persons avail themselves so tardily and reluctantly of these agents of human progress which inventive genius and artistic skill has given to the world. To be enabled to gain the full benefits of the many experiments constantly being made to increase the productiveness of the soil by improved culture, and to carry them forward to profitable results, there is need for thorough agricultural education. In all methods of fertilizing and improving the soil; in rotation and selection of crops; in feeding the animal; in bringing farm produce into a condition fit for market, the aid of science is not only important, but indispensable to the most advantageous prosecution of agriculture. The subject of education, with particular reference to agricultural pursuits, is one of such great importance to the country, to the community, and to every individual citizen, that I feel there is no necessity for apologizing for dwelling so long upon the same.

It is a great misfortune that the feeling should so generally prevail among an agricultural community that the mere rudiments of education are sufficient for the boy who intends to be a farmer, who—often for the sake of his assistance on the farm—is deprived of availing himself to the fullest extent of the advantages which are afforded by our magnificent Common School system; whilst for the one who has selected one of the learned professions, he recognized the necessity of a longer period of study, and all the advantages for the attainment of general information and mental training offered by the higher educational institutions. The farmer should recollect that until he obtains an amount of information adequate to the highest demands of this progressive age he will not possess the means of securing that pecuniary independence which is one of the necessary adjuncts of free-citizenship, and that he will also fail to reach that elevated social position wherin man's best and highest powers are developed and exercised, and the happiest results of a well-spent life worked out. To the farmer I would say that the real dignity of his profession is determined, not by the fact that a few great men, here and there, have belonged to it: it springs from its relations to the interests of society, and from the character of the majority of those engaged in it. I contend that the farmer should enjoy all the highest advantages of mental culture for a training suitable to his business, for the acquisition of an intelligence that shall make his work more effective, while it enables him to stand up in society among the foremost for real mental power. The time, the age, the progress made in other departments of life, press the subject upon him, and when once his energies shall be earnestly enlisted there is nothing in this direction which his efforts may not accomplish.

This annual gathering of the farmers of this country in itself dignifies the labour of which it is but the exponent. It is most gratifying to know that the influence of these Agricultural Associations has uniformly had this tendency, and that a great change in this particular is clearly discernible where these means have been successfully applied. The notion that agricultural pursuits were not suited to mental acquirements that an educated farmer was likely to be an unsuccessful one, and that if a man knew how to hold his plough and reap his grain he had all the knowledge that a farmer need to have—is already exploded. These Agricultural Societies scattered throughout the land have done much to correct this false view and to give in its place the conviction that farmers must be educated. When this principle shall have been fully settled, we shall have the dignity of farm labour truly vindicated.

While our Common School system, the equal of which cannot be found in any country, has done much for the youth of our country, it is to be regretted that the curriculum does not embrace those branches of education which are so essential to those who purpose pursuing the profession of farming. The study of natural sciences should be introduced into all our schools, and prosecuted by all pupils who have made sufficient preliminary attainments. They ought to learn enough of botany to understand the process of growth,

from germination to maturity, of all cultivated plants, grains, and vegetables, with the use of every part, as accurately as the different portions of their own labour. They ought to study chemistry until they know the nature and properties of all the elementary substances which enter into the composition of plants and animals; and all the gases essential to their health and life, and just what food the wheat or the potato requires, so that they may feed them with precisely the diet each needs, as intelligently as they would administer to the wants of the horse or other animals. By such a course the mind would begin to be disciplined, would acquire habits of reflection and investigation, and the young farmer would afterwards enter upon his employment with some adequate conception of its dignity and importance. A proper and thorough system of agricultural education introduced into our Common Schools as well as the schools of a higher standard, particularly in the rural districts, would have a tendency to popularize the profession of agriculture, and remove that prejudice which is readily created in the minds of our youth against what they believe to be the laborious pursuit of agriculture, especially when brought in contact with those whose greatest ambition is to follow one of the learned professions or engage in mercantile pursuits, which possess so many fascinating influences.

There being a great preponderance of the agricultural class in the country, it necessarily follows that in all rural districts the schools are well filled with those who are to be engaged in the same business. There is a large field for agricultural science, which may be cultivated to advantage in the Common Schools. At present there are but few who are qualified in these schools to impart instruction in the science of agriculture, although the attention of those who have the charge of our educational institutions has been repeatedly drawn to this great defect in our school system. It but remains for the farming community to bring their united influence to bear upon those whose duty it is to see that that system keeps pace with the times, and the defect will, I am sure, be speedily remedied.

The Legislature of Ontario has already recognized the importance of an agricultural education by the establishment of a College which, I am pleased to admit, as one of those who originally supported the scheme and voted in favour of the experiment, has already done much to disseminate agricultural knowledge. It cannot, however, be expected that this institution, limited in its extent and its resources, can fully accomplish the aims of its original promoters, unless its usefulness can be enlarged and extended by the affiliation of other schools in different sections of the Province, in which the elements of agricultural knowledge must be taught, and which will act as a feeder to the school at Guelph. A very large number of pupils from different parts of this Province, as well as a very considerable number from the other Provinces, have already taken advantage of the opportunity afforded them for the acquisition of agricultural knowledge at this institution; and from the report that has been placed in my hands by the head of that institution, there is abundant evidence of its influence among our rural population. We can have no better criterion by which to judge of the increasing popularity of this institution than the roll of students—embracing, as I have before stated, pupils from all the Provinces—and the fact that applications for admission to the number of 200 were refused during last year, many being from Great Britain and the neighbouring Provinces. In 1875 there were 32 students; in 1876, 40; in 1877, 87; in 1878, 146; and in 1879, 162. The experiment having been fairly tried, no person will now say there was no necessity for the foundation of an Agricultural College, with an experimental farm, and able teachers to instruct its pupils—in the lecture room, in the laboratory, and in the field—in all the innumerable applications of science to agriculture and arts: to accustom them to the best methods of cultivation, and the skilful use of the best farming implements; to acquaint them with the best farm buildings and the different breeds of animals; to enjoin upon them system and habits of careful observation and reflection; in fine, to make them comprehend all the principles and the whole science of husbandry, with all its practical details, and the reason for them, and at the same time to give them a fondness for this noble occupation. The Agricultural College having now become one of the institutions of the country, and having so successfully, under so many adverse circumstances, largely fulfilled its mission, it only remains for the Legislature to extend its usefulness

and, if need be, to establish other institutions of a similar character in different parts of the Province, so that every section of the Dominion may enjoy the benefits of a thorough agricultural training; although I am free to admit that I would prefer to see one college, with a high standard of agricultural training, fed from the Common and High Schools of the Province. This College, however, if it is to retain its popularity, must be affiliated with the Toronto University, where degrees in agriculture can be conferred, which will be a guarantee to the public that the holder of the same has reached the highest point in his profession, or the College itself must have the degree-conferring power given to it by the Legislature.

There is no reason whatever why farming in this country should not reach that state of perfection which is to be found in the mother country, if a proper system be adopted. That which is there considered most important to insure success, viz., under-draining, a judicious system of rotation of crops, and, above all, the destruction of noxious weeds, is largely neglected in this country.

It is a well-known fact that under-draining has done more than anything else to render agriculture in England superior to that of most countries. In a new country like ours it is important that a farmer should know what lands would be improved by draining, what lands would be profitably under-drained, and the best methods of under-draining. It may be conceded that where a soil is underlaid by a porous subsoil nature has already accomplished the work of draining better than can be done by artificial means. But all lands of ordinary fertility naturally, which have a subsoil retentive of water, will most certainly be benefited by draining. The subsoil may be clay, hard pan, or anything else; it makes little difference what it is so long as it keeps the superfluous water from easily passing off. The result of such obstructions are readily recognized. It is said that one of the easiest modes of deciding what lands need draining is by digging a hole three feet in the soil, and if water remain in it at any time for three days continuously, it needs draining. It does not follow that all lands which would be improved by draining would yield a profit in consequence of its being done. This matter of profit depends upon various considerations. First, the character of the soil itself. There is some land that will not pay for fencing or for draining. The elements requisite for fertility may be wanting, or so deficient as to render the ground unproductive. Again, the location of the land may be such that although the improvement would quadruple its productiveness, if inaccessible, or if in a district where as good land as it would be after being thus improved could be bought for less than the cost of draining. It is important to know whether the improvement will pay a good profit, or how much the land would be worth after draining. And this is mainly dependent upon the character of the land and its situation, so that land which it pays to drain in some situations would not be profitable to drain in others. The benefits to be derived from under-draining are almost incalculable. It warms the soil by carrying off the stagnant water and permitting the warm rains of summer to go down, carrying warmth in their course; it enables the farmer to work the soil much earlier in the spring and much sooner after heavy rains; it enables roots to descend farther and take better hold in the ground, and grow more vigorously and luxuriantly; it prevents the freezing out of roots in the winter; it serves as a valuable security against drought by enabling the roots to penetrate more deeply in the early spring, and thus obtain a supply of moisture during the dry season, and, in addition to all these advantages, it saves the necessity for open ditches, which have to be kept up at great expense, and which necessarily occupy much of the space on the farm which might be used for the purpose of cultivation.

Among the many practical questions presenting themselves to the farmer for solution, there is probably not one ordinarily passed over more lightly, and at the same time of more importance, than the question of what crops he shall plant and sow from time to time. Very often it is settled by present convenience, chance, or perhaps more often by the way the farmer has become accustomed to do it without any fixed rule. Experience has proved, what might be very readily supposed, that the ordinary farm crops require to be changed round, or not cultivate for any great length of time the same crop upon the same place. Of course to this there are exceptions. Grass, it is well known, may be raised for an indefinite period by top-dressing and occasionally turning over the sod, manuring, rolling

and seeding down. The demand which exists for a variety of products for home consumption, and the uncertainty which attends all crops, seem to make it imperative to raise a a variety of crops. It necessarily follows that inquiry must be made whether or not the same crop can profitably be raised upon the same ground for successive years. A system of rotation leads to doing more upon the farm, as well as doing it better, to using more manure, as well as supplying the same to greater advantage. The particular succession which should constitute a rotation may be different in different localities, and depend somewhat upon the character of the farm to which it is applied, the locality, access to markets, the means of the farmer, and possibly his tastes and disposition. It is claimed, and fact and argument support the assumption, that upon every sufficiently cleared farm, some judicious system of a succession of crops, extending over not too long a series of years, ensuring a change before the soil shall have become exhausted under any one crop, must be adopted to realize the greatest return for expense incurred, and at the same time most surely and steadily improve the soil.

The greatest impediment to agricultural improvement and the profitable employment of farm capital is the growth of weeds. Some of the best grain-yielding soils in the country twenty years ago have, in consequence of the over-cropping and negligent culture, become so exhausted, and filled with the seeds of noxious weeds, as to be almost wholly incapable of yielding paying crops, and no inconsiderable portion of such lands may now be regarded as almost worthless. Every weed suffered to grow robs the crop of just so much food, lowers the stamina of the soil, and operates most seriously against any improved and profitable system of cultivation. Wherever the eye can reach in travelling through a very large section of Ontario, we find that abominable enemy of the farmer, the Canada thistle, gradually destroying a very large number of the best farms. Notwithstanding the stringent enactments on the subject, there appears to be a reckless indifference to the discharge of duty among those upon whom the Legislature has conferred the power of destruction. It is time some steps were taken for the eradication of this abominable pest, which forms an insuperable barrier to agricultural progress, and consequently to the increase of wealth and national prosperity. Nothing short of the imposition of a fine upon every person who permits a thistle to ripen on his farm will ever cause its destruction.

It is, however, satisfactory to know that in some branches of agriculture Canada is not only keeping pace with, but is largely outstripping, our neighbours on the other side of the line. I refer particularly to the manufacture of cheese, the cultivation of fruit, and the breeding and exporting of cattle.

The Dairymen's Association, which, as I have already noted, has made such a creditable display, occupies a conspicuous place in the agricultural world, and has rapidly developed the art of cheese making within the last few years. Instead of, as but a few years ago, being importers of dairy products, Ontario has become a large exporter, and to-day competes in the old world successfully with the products of that country, and largely outstrips our American neighbours, when the relative populations are taken into account. As an evidence of the wonderful progress made in this industry within the last few years, I need only refer to the official record of the exports. In 1869, Ontario and Quebec exported 446,260 lbs., of the value of $548,792; in 1876, 31,805,543 lbs., of the value of $3,741,292; and in 1878, 46,389,763 lbs., of the value of $4,000,000. It is satisfactory to know that the cheese produced by Canadian factories has already attained a good position in the British markets for flavour, and specially for its keeping qualities. The amount exported has steadily increased, and as a consequence this great source of wealth is assuming a greater importance every year. Our prospects in the future must mainly, as in the past, depend upon the quality of the article exported. Our character and reputation as a dairy country will depend on the skill and determination of our farmers to keep pace with the improvements which are being made in the breeding and management of stock suitable for dairy purposes, and in procuring from the farm an abundance of such kind of food as experience and science demonstrate to be the best suited for the purpose.

No department in all the routine of farm operations is more useful or interesting than fruit culture, and, strange as it may appear, many who have all the necessary advan-

tages for producing fruit to a greater or less extent neglect it entirely, and seem content to do without it themselves, and deny their families the greatest luxury the farm can produce. Every one who cultivates a spot of land should raise some fruit and have it fresh from his own trees. Nothing is more grateful to the taste than good ripe fruit, and it is generally conceded that the free use of it is necessary to the preservation of health. Nothing is more ornamental round a dwelling, or will better adorn a garden, than fruit trees and vines, with their luxuriant foliage, their fragrant blossoms, and blushing fruits, and a good and well-conducted orchard may be made one of the most profitable of farm productions. One of the principal causes of discouragement in putting out new orchards has been brought about by the purchase of unservicable, worthless trees from unprincipled agents, instead of purchasing from reliable nurserymen, many of whom we have. Another cause of discouragement is improper location and treatment. Some have planted on flat and heavy soil without a suitable preparation by under-drain ing, and the trees have soon become stunted and worthless; others have planted in rich sandy soil, which has induced a rapid growth of wood, and consequently an early decay, Thanks to the energy displayed by the Fruit Growers' Association of Ontario, which has now become one of the settled institutions of the country, the cultivation of fruit has rapidly increased during the last few years, and now it has developed into one of the most important industries in a very large portion of Ontario.

The visit of the tenant farmers' delegates to this country during the past year cannot but have a very beneficial effect in connection with immigration. Selected as these gentlemen were by the different counties in England, as independent farmers, who thoroughly understood what was most needed by the agricultural community, their opinions will have a greater weight than those of paid agents from this country, who, in too many instances, have practised deceit upon the intending immigrant. Their report, which has been published, contains a very elaborate account of their visit to the several Provinces, and enables us to judge of the estimate formed by these gentlemen of Canada as a field for the immigrant. They almost unanimously agree that Ontario offers the greatest advantages to the agricultural labourer. The inquiry made by these gentlemen seems to have been of the most searching character. The system of responsible government and its effect upon the people; our educational system, which they describe as being of the most perfect description: the nature of the climate, which, so far as they were able to judge, was preferable to that of Great Britain; the soil and its capacity for production, are all discussed and commented upon favourably by them. I cannot do better than quote from the report of one of these delegates on his return to England. He says:—

"Such a vast tract of land as Canada must necessarily contain a great variety of soil. The surface soil varies from light sand to heavy loam, a medium fertile soil predominating, with generally a heavy clay subsoil. The great wealth of the Dominion of Canada undoubtedly is her soil. Although only a new country as compared with others, she is already well known as a great meat and corn producing country. There is not, I believe, a more contented man in the world than the owner of this soil; he may not have command of as much capital as some English farmers, nor does he keep his land in such a high state of cultivation, yet the land he occupies is his own, his taxes are light, and, as a rule, he is a happy and independent man. In a country like Canada it would be absurd to expect the farming to be carried on in as scientific a manner as in England; the land is so abundant that a greater breadth is cultivated, in proportion to the population, in what an English farmer would consider a rough sort of a way. It speaks well for the character of the soil and climate that under such adverse circumstances such excellent crops are obtained; in too many instances the land is merely scratched over. The general excellence of the soil, and other favourable conditions for feeding all kinds of stock, which prevail in the Provinces of Ontario and Quebec, together with the immense areas available, I think, leave no room to doubt that Canada, in the near future, is capable of supplying us with more cattle and sheep than she is now doing. It is not more than five years since the Canadian farmer looked upon wheat as being the chief production; to-day the growing of beef for England is their first consideration, wheat only taking second place.

As this implies a complete cropping of the farms, the Canadian farmer of the future will have to practise what will be to him a new system of farming."

We have again been favoured with a visit from His Excellency the Governor-General, who, like many of his predecessors, has taken the greatest interest in these annual displays of the agricultural and mechanical industries of the country. The many valuable and practical suggestions which he made cannot but have a very beneficial effect. The absence of Her Royal Highness the Princess Louise, through that unfortunate accident which lately befel her, has caused the most profound feeling of regret among all who have visited our Exhibition, many of whom still hoped that she would have been enabled again to have honoured us with her presence. I am sure I but speak the sentiments of every person in this country, when I say, that no person has ever visited the Dominion for whom the hearts of Canadians have beaten with greater feelings of admiration, love, and respect, all of whom devoutly pray that her Royal Highness may speedily be restored to health, and grace with her presence his Excellency's household.

In conclusion, I have to thank the Directors and Officers of the Association for their uniform kindness and courtesy shown towards me on all occasions since I have been honoured with the highest position in the gift of the agriculturists of Ontario.

On motion of Senator Christie, seconded by Mr. Wm. Saunders, a vote of thanks was unanimously accorded to the President for his address, after which Messrs. John Cavers, of Galt, and Henry Wade, of Port Hope, were unanimously chosen Auditors for the ensuing year.

Mr. Thomas Stock, of Wentworth, seconded by Mr. John White, of Halton, then moved the following resolution, which was carried unanimously: "That in the opinion of this meeting, the Provincial Exhibition—having been largely the means of developing agriculture in the Province—should not be confined to one locality, but should be held in convenient and suitable places in different parts of the Province."

The motion to hold the next Exhibition at London, and to keep it open from Wednesday of the first week to Thursday of the second, was unanimously adopted.

Financial Results.

The total amount received for members' subscriptions, rent of refreshment booths, rent of stables and stalls, sales of forage, and admission fees was $13,960.16, against $11,656.96 in Ottawa, 1879; $23,488.89 in Toronto, in 1878; $21,734.45 in London, in 1877; and $13,687.95 in Hamilton, in 1876.

I have the honour to be,
Sir,
Your obedient servant,
John R. Craig,
Secretary.

RESULTS of the Exhibition of 1880, shewing the Amount offered in Prizes, the Amount Awarded, and the number of Entries in 1880, 1879, 1878, 1877, and 1876.

CLASSES.	Amount offered, 1880.	Amount awarded, 1880.	Number of Entries, 1880. Hamilton.	Number of Entries, 1879. Ottawa.	Number of Entries, 1878. Toronto.	Number of Entries, 1877. London.	Number of Entries, 1876. Hamilton.
	$ cts.	$ cts.					
Thoroughbred Horses	277 00	199 00	50	39	51	63	40
Roadster Horses	390 00	376 00	196	123	194	329	302
Carriage Horses	448 00	434 09	221	149	211	373	266
Agricultural Horses	351 00	347 00	148	122	215	203	204
Heavy Draught Horses	414 00	308 00	90	59	115	107	116
Durham Cattle	644 00	640 00	134	102	283	205	167
Hereford Cattle	355 00	335 00	46	33	27	41	41
Devon Cattle	355 00	277 00	42	51	45	65	37
Ayrshire Cattle	543 00	543 00	103	194	129	137	99
Galloway Cattle	355 00	305 00	37	54	47	none.	50
Jersey, or Alderney Cattle	117 00	104 00	23	61	27	14	..
Holstein Cattle	25 00	.....	.....	.....	.....	.....	.....
Grade Cattle	250 00	235 00	29	62	63	64	53
Fat and Working Cattle	290 00	272 00	46	61	66	65	37
Cotswold Sheep	268 00	268 00	155	55	241	141	189
Leicester Sheep	266 00	266 00	204	137	184	294	298
Lincoln Sheep	234 00	234 00	94	54	85	201	160
Southdown Sheep	292 00	272 00	136	105	107	112	157
Shropshire and Hampshire Down Sheep	148 00	148 00	60	44	15	38	26
Merino Sheep	.....	.....	.....	.....	.....	39	22
Fat Sheep	87 00	83 00	26	36	24	34	35
Improved Berkshire Pigs	250 00	245 00	131	123	214	276	84
Suffolk Pigs	238 00	238 00	141	90	147	152	46
Essex Pigs	228 00	218 00	76	35	42	31	24
Yorkshire and other Large Breed Pigs	228 00	223 00	59	107	68	73	82
Poultry	205 00	196 00	417	284	395	402	440
Chickens and Ducks of 1880	138 00	123 00	404	176	425	443	545
Agricultural Implements and Machines (for Exhibition only)	.....	.....	141	121	185	149	123
Do do (Power)	391 00	294 00	152	233	182 / 84	183 / 149	123 / 98
Do do (Hand)	331 00	132 00	77	116	157	152	86
Field Grains, Hops, etc	489 00	470 00	381	506	319	456	342
Small Field Seeds, Flax, etc	196 00	135 00	113	185	80	81	81
Field Roots	227 00	207 00	452	400	314	644	314
Dairy Produce	956 00	928 00	257	276	86	112	314

RESULTS of the Exhibition of 1880, &c.—*Concluded.*

CLASSES.	Amount offered, 1880.	Amount awarded, 1880.	Number of Entries, 1880, Hamilton.	Number of Entries, 1879, Ottawa.	Number of Entries, 1878, Toronto.	Number of Entries, 1877, London.	Number of Entries, 1876, Hamilton.
	$ cts.	$ cts.					
Honey, Sugar, Bacon, etc	77 00	44 00	45	78	67	61	36
Domestic Wines	92 00	65 00	62	47	50	39	62
Fruit (Professional List)	230 00	221 00	80	75	101	111	93
Do (General List) Apples and Pears	365 50	346 50	1985	813	1792	617	930
Do do Plums, Peaches, etc	422 00	362 00	943	550	601	474	425
Garden Vegetables	180 00	172 00	611	475	433	643	442
Plants and Flowers	325 00	310 50	380	308	293	278	260
Fine Arts (in Oil)	254 00	252 00	191	162	181	166	131
Do (Water Colours, Pencil, Crayon, etc.)	332 00	283 00	361	319	354	284	317
Do (Penmanship, Linear Drawings, etc.)	234 00	149 00	75	139	141	101	96
Natural History, Mineralogy, etc	274 00	167 00	54	86	29	33	31
Ladies' Work (Ornamental)	215 00	175 50	143	628	372	289	322
Do (Useful)	114 50	93 00	216	416	369	324	401
Chemical Manufactures, etc	152 00	54 00	39	78	87	43	30
Printing, Bookbinding, Paper, etc	111 00	71 00	33	28	68	47	39
Musical Instruments (for Exhibition only)			19	6	18	15	47
Building Material, Work in Marble, etc	214 00	67 00	50	61	88	58	59
Cabinet Ware, etc	323 00	136 00	86	100	168	126	95
Carriages, Sleighs, etc	315 00	253 00	156	113	158	217	120
Machinery, Tools, etc	995 00	252 00	135	194	422	213	245
Sewing Machines			48	24	45	60	49
Metal Work (Miscellaneous)	283 00	60 00	73	92	268	237	398
Stoves and Castings	166 00	116 00	159	152			
Saddlery, Engine Hose, etc	260 00	104 00	50	54	45	54	53
Shoe and Bootmakers' Work, Leather, etc	179 00	46 00	41	72	59	102	91
Wearing Apparel, Furs, Flax, and Cotton Goods	245 00	87 00	71	76	46	44	49
Woollen Goods	315 00	161 00	139	190	63	76	109
Groceries and Provisions	195 00	85 00	72	128	100	78	86
Bonusses for Importation of Live Stock							
Medals, etc							
Totals	16,994 00	13,147 50	11,252	9,668	11,292	10,618	10,011

ONTARIO VETERINARY COLLEGE.

Session 1879-80.

This institution, which is in connection with the Agricultural and Arts Association of Ontario, fully sustained its reputation during the past session as the leading Veterinary School of this continent.

The staff of professors was much the same as in former years. During the session Professor Smith, Principal of the College, gave daily lectures on the Anatomy and Diseases of Farm Animals; Professor Buckland lectured on the History, Breeding and Management of Live Stock; and Dr. Thorburn on Veterinary Materia Medica. The students had the privilege of the

School of Practical Science in Chemistry,

Dr. Ellis giving a special course for their benefit in that institution. Dr. Oldwright had the charge of Physiology, and Mr. Duncan, V.S., that of Practical Anatomy. Clinical instruction and demonstration was under the Principal and assistants.

Seventy-nine students were in attendance during the session. These students came from various parts of the Dominion of Canada and the United States. As a body they may be truly said to have paid strict attention to the abundant means which the College possesses of theoretical instruction and of obtaining a thorough knowledge of the practice of the profession, brought up to the advanced standard of the present day. The facilities afforded by the possession of a good professional library with an extensive and well-arranged Museum, in connection with Infirmary and extensive out-of-door practice, are now very complete, and with ordinary diligence on the part of students in attending lectures and demonstrations, ample provision is made for obtaining a sound knowledge of the veterinary profession, both in science and practice.

The work of the session resulted in the graduation of twenty-five students, who received their diplomas after a searching examination by the Examining Board. Three gentlemen also passed a primary examination.

In conclusion, it may not be out of place to refer to the

Veterinary Medical Association,

in connection with the College, which has been in successful operation for several years. The members hold weekly meetings during the session for reading papers and discussing subjects relating to the science and practice of veterinary medicine. With the exception of the President, the work of the society is carried on by the students themselves, and it has proved an efficient means of awakening among the members a spirit of inquiry, favourable to the formation of habits of systematic study and accurate observation.

I have the honour to be,
Sir,
Your obedient servant,
John R. Craig,
Secretary.

APPENDIX TO REPORT

OF THE

Commissioner of Agriculture and Arts.

APPENDIX (C).

ANNUAL REPORT OF THE FRUIT GROWERS' ASSOCIATION OF THE PROVINCE OF ONTARIO, FOR THE YEAR 1880.

To the Honourable the Commissioner of Agriculture.

Sir,—In submitting the Report of the Fruit Growers' Association of Ontario for the year 1880, I have the pleasure of stating that the meetings of this Association have been very interesting and instructive, and that the members continue to take a deep interest in its proceedings. The publications of the Association are much sought after, not only at home, but abroad, by the leading horticulturists. A copy of the *Canadian Horticulturist* for the current year is also submitted herewith. The Association has been able to make a beginning in the way of calling attention to the subject of forestry, the importance of which can hardly be over estimated. Trusting that the present report will be found to be a very useful contribution to our knowledge of fruit-growing and both ornamental and economic forestry,

I have the honour to be

Your most obedient servant,

D. W. Beadle, *Secretary.*

PROCEEDINGS AT THE ANNUAL MEETING.

The Annual Meeting of the Fruit Growers' Association of Ontario, was held in the City Hall, Hamilton, on Tuesday evening, 21st day of September, 1880.

The President, Rev. R. Burnet, was not able to be present, having removed to Pictou, Nova Scotia, and the meeting was called to order by the Vice-President, Wm. Roy, Esq., of Owen Sound, who stated that a telegram had been received from the President, saying that he would not be present, and that the usual able annual address would not be forthcoming at this time, the President not having sent any to be read. After the usual routine business the meeting proceeded to the election of officers for the year, with the following result, viz.:—

President—P. C. Dempsey, Esq., Albury, Prince Edward Co. Vice-President—Wm. Saunders, Esq., London, Middlesex Co.

Directors—Electoral Division No. 1, John Croil, Aultsville, Stormont Co.; No. 2, P. E. Bucke, Ottawa; No. 3, W. Fitzsimmons, Brockville; No. 4, Henry Young, Trenton, Hastings Co.; No. 5, Thomas Beall, Lindsay, Victoria Co.; No. 6, George Leslie, Jr., Leslie, York Co.; No. 7, S. Woodley, Hamilton; No. 8, A. H. Pettit, Grimsby, Lincoln, Co.; No. 9, C. Arnold, Paris, Brant, Co.; No. 10, A. McD. Allan, Goderich, Huron, Co.; No. 11, P. R. Jarvis, Stratford, Perth Co.; No. 12, Stephen White, Charing Cross, Kent Co.; No. 13, Chas Drury, Crown Hill, Simcoe Co.

Auditors—John A. Bruce, Hamilton; Angus Sutherland, Hamilton.

Subsequently, at a meeting of the newly elected Board of Directors, Mr. D. W. Beadle, St. Catharines, was appointed Secretary-Treasurer.

DIRECTORS' REPORT.

To the Members of the Fruit Growers' Association of Ontario.

Gentlemen,—In closing another year of the history of this Association, we desire to congratulate the members upon the continued interest manifested in the objects which it is our aim to foster and advance. The past season has been very favourable to fruit interests generally, the crops of the several fruits in their season having been very good, and those of peaches and grapes unusually abundant. Such displays of fruit as are being made this year at the several exhibitions throughout the Province will tend to convince the most sceptical that this country cannot be surpassed in the production of fruits, which will not only amply supply our own population with an abundance, but will contribute largely to meet the foreign demand. The apples and pears grown in Ontario cannot be surpassed in excellence of flavour, nor in those qualities requisite for shipping to long distances.

In the section of the Province extending from Kincardine to Collingwood, the crop of plums had been very abundant, and many thousands of bushels have been shipped with profit to the growers. Nor can we believe that the labours of this Association have been without effect in stimulating the production of these choice varieties of fruit.

The last winter meeting, which continued for two days, was one of more than usual interest, and was both well attended and well sustained. Interesting and valuable papers were read, which will appear in full in the Annual Report, embracing a wide range of subjects, and giving to that of ornamental and economic shade and forest tree planting a greater prominence than it has hitherto enjoyed. The summer meeting, which was held at Guelph, was not very largely attended, but the discussions were interesting and profitable. An opportunity was given to the members to visit the model farm, where they were kindly received and most hospitably entertained.

In consideration of the enlarged operations of the Society, whereby the subjects of tree planting for shade, ornament, and economic purposes, and general horticulture, have been added to that of fruit-growing, the Government have made an addition to the annual grant, raising it to eighteen hundred dollars. There has also been placed under the supervision of your Board of Directors several acres of the Government Farm at Guelph, for the purpose of testing new fruits, trees, and plants, and of illustrating the value and methods of culture not only of fruit-bearing trees and plants, but of forest trees and other trees and shrubs that may be valuable in our climate either for purposes of ornamentation or of economic industry. Your Directors have entered upon this new branch of the work of the Association, and have made a commencement in a small way, which we trust will prove to be the first steps in the direction of great and valuable results.

The reports received from those of our members who have participated in the yearly distribution of new fruits have thus far been comparatively few. The object of this distribution is to ascertain the adaptability of these fruits to the several localities into which they are sent, and, unless members are more careful to report results, the ends we aim at cannot be attained. We are aware that a measure of success has been achieved from the fact that fruits grown from the trees and vines distributed have been shown at exhibitions and received prizes, and we trust that in future we shall receive a report from every locality into which they have been sent.

The *Canadian Horticulturist* has been regularly issued during the year, and it is very gratifying to your Directors to be able to say that the expressions of appreciation and satisfaction with the journal and its contents, which have been received from many of our members, convince us that its publication is an important part of the work of the Association.

We are happy to state that there has been an increase of membership over the number in the previous year, which, though not large, is a gratifying assurance that the Association is gaining ground in the interest and appreciation of the public. Notwithstanding this, however, we hope that all of our members will increase their efforts to extend the benefits of the Association by obtaining each at least one new member.

On behalf of the Directors,

WM. ROY, *Vice-President.*
D. W. BEADLE, *Secretary.*

To the President and Members of the Fruit Growers' Association.

TREASURER'S REPORT.

The Treasurer of the Fruit Growers' Association.

Dr.	$ cts.
To Members' fees	1,136 00
" Sale of back vols. of *Horticulturist*	1 50
" Advertising	24 50
" To Government grant	1,800 00
Total	2,962 00

Contra.	$ cts.
By Postage and telegrams	35 87
" Expenses—Directors and Committees	717 25
" Freight and express	7 24
" Duties	6 51
" Printing and advertising	185 09
" Secretary's salary	200 00
" Tree distribution—1879	540 33

Contra.	$ cts.	$ cts.
By Commissions	22 33	
" Guarantee premium	20 00	
" Rooms—holding meetings	7 00	
" Paper	197 59	
" Audit—1879	20 00	
" Clerk	50 00	
" Editor's salary	300 00	
" Balance due Treasurer—1879	134 55	
	— —	2,443 76
Balance in Treasurer's hands		518 24

We certify the above to be a correct abstract.

JNO. A. BRUCE,
ANGUS SUTHERLAND, } *Auditors.*

AUDITORS' REPORT.

HAMILTON, 30th Sept., 1880.

To the President and Directors of the Fruit Growers' Association of Ontario.

GENTLEMEN,—We have much pleasure to inform you that the Books, Vouchers, etc., of your Association are kept in a neat and correct manner by your Secretary-Treasurer, Mr. D. W. Beadle, and that he rendered us every assistance in the performance of our duties.

We also desire to congratulate the Association upon the favourable balance-sheet to be presented by him to you.

We are yours very respectfully,

ANGUS SUTHERLAND,
JNO. A. BRUCE, } *Auditors.*

WINTER MEETING.

Held in the City Hall, City of Hamilton, on Wednesday and Thursday, February 18th and 19th.

The winter meeting of the Fruit Growers' Association of Ontario opened this forenoon at ten o'clock, in the Council Chamber, at the City Hall, the President, Rev. Dr. Burnet, of Hamilton, presiding. There were also present Messrs. D. W. Beadle, Secretary; Wm. Roy, Vice-President, Owen Sound; W. Smith, Drummondville; P. E. Bucke, Ottawa; John Croil, Aultsville; P. C. Dempsey, Albury, P. E. Co.; A. McD. Allan, Goderich; Murray Pettit, G. W. Cline, Winona; Thomas Beall, Lindsay; Charles Arnold, Paris; W. Saunders, London; Dr. Watt, Niagara; J. S. Woodard, Lockport, N. Y.; H. M. Switzer, Palermo; John Buchan, Stratford; Chief J. H. N. Johnson, Tuscarora; Jesse Moyer, Jordan Station; John McGill, Oshawa; J. D. Pringle, Hamilton; W. Holton, Barton; Judge Darnell, Whitby; B. Gott, Arkona; Jos. Cline, Ancaster; Jas. Hinchcliffe, Hamilton; J. Bowman, West Flamboro'; Dr. Bell, Walkerton, and others.

Mr. Beadle read the minutes of previous meeting, which were, on motion, adopted.

The President said that it gave him great pleasure to welcome to the meeting, Mr. Woodard, from the other side of the line—Lockport, New York. The Association would join him (the President) in extending the gentleman a hearty welcome.

On being reminded by the Vice-President,

The President announced that the Ontario Government had increased the annual grant to $1,800. This was most encouraging. He was glad to inform them that Mr.

Wood, in speaking of the grant to this Association, had stated that it was more beneficially expended than that given to any other organization in the Province.

Dr. Burnet said that he had communicated with some eminent pomologists with a view of obtaining papers on subjects interesting to the Association. His friend, Dr. John A. Warder, President of the American Forestry Association, of North Bend, Ohio, U. S., had responded and sent in a paper on "Planting Trees along our Roadsides for Shelter, Shade and Ornamentation; What to Plant and Benefits of such Planting." The President then read the paper, which is a very lengthy but intensely interesting one. It was received with marks of approval.

While the Rev. Dr. Burnet was reading, the chair was occupied by the Vice-President.

The Vice-President said that the paper was a most appropriate one. There was nothing which should take the attention of the people more than the planting of shade trees.

A vote of thanks to Dr. Warder, moved by Mr. Saunders, of London, and seconded by Mr. Gott, of Arkona, was unanimously passed.

The mover made some very interesting remarks on the paper, pointing out what were and what were not desirable specimens to be planted.

Messrs. Arnold, Holton, Darnell, Bucke, Smith, Johnson, Gott, Burnet, Woodard, Beadle, Roy, Croil, the President and others, spoke on the matter contained in the paper, each paying a high compliment to its excellence, and giving their own experience.

Mr. Woodard said that the maple was the principal shade tree in Western New York. He favoured the black walnut. It had many advantages, not the least being its splendid timber.

Mr. Beall informed the Association that he had been absent a portion of the time from the chamber, finishing a paper to be read, and had now made the discovery that it was on the same subject as what the doctor had selected. Maybe it would be as well for him to read it now.

The President told him that it would be heard in the afternoon. There were no less than four papers on the subject, and the discussion of these would take up all afternoon,

The meeting then adjourned until two o'clock.

The session resumed at two o'clock, and the President introduced Mr. Page, editor of the *Canadian Farmer and Grange Record*, who took a seat with the members.

Mr. Beadle spoke of Mr Page's paper as a most acceptable exchange, containing a great deal of information for the agriculturist and horticulurist as well.

Yellows in Peaches.

The Secretary read the following notice of motion: That Dr. Watt will call the attention of the Society to the disease called yellows in peaches, and will ask for some action to be taken in representing the same to the Local Legislature for some power to be given to municipalities for the proper destruction of the infected trees.

The Secretary said there were a good many of the members who wished to hear "the yellows" discussed, and he thought it would be well to digress and discuss this question.

On motion, it was decided to take up this subject.

Mr. Orr, of Stony Creek, was called upon by the President, and said that he was not posted on the matter, but was about to set out an orchard between here and Grimsby, and would like to gain information. The yellows were spreading in the locality where he resided, and something should be done.

Mr. Beadle read from the law of the State of Michigan, wherein it was enacted that all peach, nectarine and other fruit trees infected with the yellows shall be destroyed, and that none of the fruit of such trees be sold or shipped under pain of severe penalties.

Dr. Watt, Niagara, said that the subject was thoroughly discussed, but since then his attention has been called to them by a neighbour of his, General Lansing, who suffered the loss of some trees. He (Dr. Watt) was called in professionally, and ordered the limbs to

be cut off and the roots dug out and burned. This is the only way to get rid of the yellows.

Dr. Watt went on to give some interesting facts about the yellows. He claimed that the consumption of fruit infected with this disease was dangerous as human food. A family at Drummondville had sickened from partaking of such fruit. The law of the State of Michigan was too voluminous for this country. He thought that a law, as simply constructed as possible, should be recommended, and urged the appointment of a delegation from the Association to visit Toronto and see the Government about the matter. A commissioner should be appointed.

Mr. Pettit looked on it as one of great importance, and all fruit growers should do all they could to prevent the spread of the disease. The trees should be cut down. The yellows spread from tree to tree; he knew this of his own personal experience. On an examination of his trees last year four were found to be affected; now some twenty-five in the neighbourhood of these infected trees are very bad.

Mr. Pettit was asked why he didn't cut down the trees that had the yellows.

Mr. Pettit said he purposed using the axe on the infected trees.

Mr. Arnold said it was always a mystery to him why people who knew their trees had the yellows didn't destroy them at once. Why wait for the Legislature to pass a law to compel them to do so? The fact was, very few people knew when a tree had the yellows.

Mr. Cline, Grimsby, gave his experience of the disease. He had no difficulty in telling the yellows in the tree, or fruit either. He had cut back the trees and manured well, but this did not effect a cure. He believed in cutting down the trees infected.

Mr. Roy asked how Mr. Pettit would renew the trees when all were cut down.

Mr. Pettit said he would not plant in the same ground. He had heard that an application of lime and salt to the land would be beneficial. His trees were procured from Mr. Wolverton, Mr. Smith, and from Canandaigua. The disease commenced in one he had procured from Mr. Wolverton. He believed there was something deficient in the soil.

Mr. Smith, Drummondville, said there was some difficulty in distinguishing the disease on trees. They may get yellows from other causes. The Association had had his experience before in the matter. The yellows were spreading in Drummondville. Not a single tree had escaped. He gave instances where he had spared one tree, and it communicated to twelve trees that year.

Mr. Arnold asked how the disease spread.

Mr. Smith answered, that it was accepted as a theory, that the disease was carried by insects from tree to tree. He thought it might be spread by using a saw on good trees which had been used in pruning diseased trees.

Col. Brooks, of Wyoming, N.Y., an eminent fruit grower and entomologist, then entered the chamber, and was heartily welcomed by the President.

Mr. Woodard, of Lockport, N.Y., was then called on to speak on the yellows, and said that the disease was giving a good deal of trouble in Western New York. They had no laws in regard to it. The people of Michigan, whom he had recently visited, were sanguine that under their law, which was being vigorously carried out, the yellows would be stamped out. He didn't know how the disease originated. His idea was, that the disease should be stamped out by the axe and fire.

Mr. Page (Fonthill) said he had given the matter some attention. He did not favour the idea that the disease was carried by insects. It was lack of something in the soil or atmosphere.

Mr. Woodard said that he had a conversation with Prof. Beal, of New York, who declared that in ninety-nine cases in a hundred it was communicated by insects.

The President gave his experience. Was not inclined to think it was a deficiency in the soil. Were it so the whole fruit would be diseased. It is in the fruit the disease is developed, but whether in the limb or fruit is not yet determined. His idea was that it commenced in the branch.

Mr. Orr asked whether any gentleman had discovered the yellows on trees before bearing.

The President said he had never been able to discover the disease until the fruit appeared.

Mr. Smith thought that it could not be definitely distinguished unless bearing fruit.

Mr. Haskins was asked to give his opinion, but said he didn't know enough about it.

Col. Brooks said that suffering came from sin—some transgression of the law. They possibly had been careless; hence the breaking out of this disease. He believed in the primitive soil, and thought that no such productions as potatoes, pumpkins, etc., should be put in to rob the delicate fruit trees of the elements of the soil which they required to bring them to perfection.

The further discussion of the subject was deferred, and the regular programme of business proceeded with. In the meantime Dr. Watt will prepare a draft of a Bill to be submitted first to the Association, and subsequently to the Local Legislature.

The Planting of Shade Trees.

Mr. Beall, of Lindsay, read the following paper on "The Advisability and Feasibility of using the Canadian Walnut Tree as a Shade and Ornamental Tree throughout Canada:"

Forty years ago, when probably there was not more than one-fifth as much cleared land in Ontario as there is to-day, the idea seemed generally to have prevailed that the woods must be utterly destroyed before the country would be suited for the operations of the husbandman; but thousands of persons throughout this fair land see that the wanton destruction of our noble forest by the early settler was far too general, and are now endeavouring to remedy the evil in some degree by planting various kinds of trees in places where most required. The inhabitants of our cities, towns and villages seem generally to have taken the lead in this good work; but many of our rural settlements are already giving evidence, in the long lines of stately maples and other deciduous trees along some of our country roads, that the landowners have become aware of the necessity of planting largely of trees for the protection of their lands from the evil effects of high winds, as well as for shade and shelter for their live stock; and where this has been accomplished to any considerable extent, the owners find that they have added much to the beauty of the landscape, and thereby greatly enhanced the value of their real estate. Now that the good work of tree planting in the rural sections so largely prevails, the question very naturally suggests itself, what is the best kind to plant? My answer is, that no tree indigenous to this Province has so many and such strong claims for consideration at the present time as the black walnut tree (*Juglans Nigra*). It is easily propagated requiring little or no skill in its cultivation; grows rapidly, has a fine appearance even while comparatively young, and when old is one of the most magnificent trees to be found in this or any other country, and, in addition to this, it is at maturity the most valuable of all our trees for its timber. It is easily propagated; for all that is required to produce the most satisfactory results is to plant the nuts about the latter part of October, about two inches deep, in the spots where the trees are needed, in a deep, rich clay soil that has been thoroughly subsoiled; and its after cultivation is simply to let it alone; to permit nothing to touch the young trees. I am not aware that any other hardwood tree grows so rapidly as the black walnut tree. A growth of from three to five feet in height during the first summer is not infrequent, and when the soil is suitable its growth is proportionately rapid for many years. I have twenty-five or thirty trees now on my grounds from fifteen to twenty feet high, with fine heads from ten to fifteen feet in diameter, all grown from nuts planted eight or nine years ago. No other trees have given me so much satisfaction as these. They have a fine appearance, and when in leaf make an excellent shade tree. The foliage emits a strong aromatic odor, very agreeable to most persons, and the tree when in a healthy state is always free from caterpillars and other noxious insects. Downing, writing of this tree, says, "When full grown it is scarcely inferior in the boldness of its ramification or the amplitude of its head to the oak or chestnut; and what it lacks in spirited outline, when compared with those trees, is fully compensated, in our estimation, by its superb and heavy masses of foliage, which catch and throw off the broad lights and shadows in the finest manner."

Its commercial value:—It is a well known fact that our black walnut lumber at the present time has a market value five or six times greater than any other produced in Ontario, with every probability—on account of its beauty of colour, the hardness and closeness of its grain, the exquisite polish which is so easily given to its surface, and above all, the peculiarity of its nature, which when thoroughly seasoned makes it less liable than any other of our native woods, or, indeed, of almost any other known wood, to contraction and expansion by change of air and temperature—of its being held for generations to come in the highest esteem for cabinet-ware purposes. What a fine field for speculation is here opened; a speculation in which every owner of land, whether the quantity be great or small, can engage, for while the owner of a quarter-acre lot may plant his one or two trees for the mere pleasure of doing a good deed, the owners of larger properties may plant their thousands of trees with a certainty of present gain, by providing, almost at once, shade for their live stock from our burning summer sun, and shelter for their growing crops during the stormy seasons of the year, thereby adding, as before stated, somewhat to the productiveness of their farms, and very materially to the beauty of the general landscape. While thus labouring for present pleasure and profit in the near future, let us see what they are doing for the future of from fifty to one hundred years hence. Every owner of 100 acres of land, supposing his farm to be divided into fields of about ten acres each, will have thereon about 1,000 rods of fence. Now suppose a tree is planted every thirty feet along this fence, it will be seen that he may have about 500 trees on his farm, without occupying a single foot of land available for agricultural purposes, and which, as before shown, will, in a few years much more than repay him for all labour and money expended thereon. I have estimated that the owner of such a farm as I have mentioned may commence selling the timber in fifty years, and that from that time forth he may safely sell one-fiftieth for each year thereafter by simply planting one nut or tree for each tree taken. Then, supposing each tree at seventy-five years of age (the average age of the first lot planted) to be worth $50 (and I think this is a low estimate) it will at once be seen that the sum of $500 per annum for the timber alone may be realized off every such farm of 100 acres for all time to come.

Much may be, and indeed I think ought to be, written upon the effects which would ensue from such a general planting of trees as I have here proposed, upon the commercial, agricultural and climatological state of our fair Province, and I venture to hope that some abler pen than mine may undertake the task at an early day.

Mr. Bucke moved a vote of thanks to Mr. Beall for his admirable paper, which was carried unanimously.

Some discussion took place on the paper, those taking part chiefly confining their attention to the cause of the opening of the seed; some considered that it was frost that caused this, and others held the opinion that it was moisture which caused the seed to burst.

Mr. D. W. Beadle said there was one objection to the walnut—nothing would grow beneath its shade.

Mr. Roy knew differently. He had visited the fine walnut grove at Chief Johnson's, in Tuscarora, and saw luxuriant grass beneath the shade of the trees.

Col. Brooks thought that the cultivation of the walnut was sufficiently profitable without expecting another crop off the same ground upon which it was planted.

Chief Johnson said that the shade of the walnut did not prevent vegetation, and this idea was endorsed by Mr. Arnold.

"What Shall We Cultivate?"

Mr. Arnold was then called upon to read a paper he had prepared bearing the above title. It was written in a very pleasant strain, and contained many valuable hints concerning the adornment of private grounds.

Mr. Allan moved, seconded by Mr. Beall, that the thanks of the Association be granted Mr. Arnold for his excellent paper.—Carried.

The cultivation of the apple tree was referred to by Dr. Watt, who threw out some practical suggestions on the subject.

"Forest Tree Seeds and Seedlings."

Mr. Gott read a paper on the subject of "Forest Tree Seeds and Seedlings," which exhibited considerable research.

The paper was received with marks of approbation by the Association, who passed a flattering vote of thanks to the writer.

The meeting then adjourned till seven o'clock.

Evening Session.

The Association resumed at a few minutes after seven, the President presiding.

Tree Culture.

The consideration of forest and shade trees was resumed.

Mr. Saunders, of London, read a paper "On some deciduous trees and shrubs desirable for more extended cultivation."

On motion of Mr. Smith a unanimous vote of thanks was tendered to Mr. Saunders.

Mr. Woodard called attention to the ironwood, a beautiful and hardy tree, of which no mention had been made.

Mr. Bucke also drew attention to the cutleaf birch and the cutleaf maple, which had not before been mentioned.

Mr. Saunders said that his paper included principally those trees and shrubs not generally cultivated.

Dr. Bell (Walkerton) objected to the ironwood on account of its slow growth.

A number of the members took part in the discussion, valuable hints as to the best kind of shade trees and shrubbery being given by Messrs. Arnold, Beall, Beadle, Col. Brooks and others.

Two of the Six Nations tribe of Indians who had entered the room while the discussion was going on, were then introduced by Chief Johnson, and cordially welcomed by the President. They were heartily cheered on taking their seats at the Board.

Mr. Beadle informed the meeting that the Indians on the reservation took a deep interest in the welfare of the Association. There were no less than sixteen of the Six Nation Indians on the membership roll.

REPORTS OF COMMITTEES.

The Committee on Cultivated Fruits presented the following report :—

Apples, shown by P. C. Dempsey, of Albury—"Lord Burghley," from imported trees; of medium size, dark reddish colour and attractive in appearance; of fine flavour, though a little over ripe; fruited for the first time this autumn; appears to be very desirable as a winter market fruit. "Ben Davis," a very handsome specimen, bright high colour, well grown and an excellent keeper. "Pomme d'Or," a yellow spotted apple, makes a good table decoration, and is well esteemed as a dessert fruit. Several important varieties were shown of various qualities, but were not named. "Ord's" apple tree imported from Ireland; apple of fine size, russety red colour, of good flavour.

Pears.—Mr. Dempsey also showed the following varieties of pears :—"Doyenne de Hiver," "Vicar," "Duchess de Bordeaux," "Lawrence," "Mount Vernon," and "Beurre d'Anjou."

Mr. A. M. Smith showed a specimen of the "Lawrence" pear.

The Committee appointed to examine seedling apples reported as follows :—

Sweet seedling apple, shown by John H. Ramer, of Markham: a large apple resembling Sweetbough, but out of season now, and we are unable to report on merits. Sweet apple, shown by Mr. A. M. Smith, of Drummondville: the flavour is good, colour

green, with flushed cheek and deep eye. We cannot decide that this is really a seedling. It is in season now, and is a pleasant apple to eat, and evidently a good cooker. Two seedlings, very similar in appearance, shown by Mr. H. J. Lott, of Sydney township, county of Hastings: somewhat resembling St. Lawrence; flesh yellowish; slightly sub-acid, but with nothing special in merit. A tart seedling, shown by Mr. George Cox, of Goderich township, county of Huron: a handsome bright yellow, with blushed cheek; flesh firm. This apple will keep well into July. Dessert russet, supposed to be a seedling, shown by Dr. Watt, of Niagara: being past its season we cannot speak clearly as to merit; flavour seems pleasant; grain firm. Another dessert russet, shown by Dr. Watt: resembles the S. P. Grise in appearance in some points; lacks in character; sweet and mild in flavour. Seedling, shown by Messrs. Day and Dempsey, of Albury, large greenish splashed cheeks; flesh firm; very slightly sub-acid and pleasant; possessing more merit than a majority of seedlings of this class. Another seedling, shown by the same firm: smaller; similar in appearance to the last, but inferior in flavour.

The reports were, on motion, adopted.

Cattle at Large, and Fencing.

An hour or so was then devoted to the consideration of the above subjects, and the practice of allowing cattle to roam at large on the highways in the country was strongly condemned, as well as the present mode of fencing, which is a source of great expense to the farmer and gardener.

Mr. Quinn, of Port Dover, considered that it was no use looking to our municipal councils for redress with respect to the cattle invasion nuisance. Legislation from a higher source was absolutely necessary.

The gentlemen present from the other side the line dwelt on the advantages of a law compelling every one to see that his cattle are kept in; if this were done every one could dispense with fences.

Col. Brooks favoured the barbed wire fence, attached to shade trees along the thoroughfares. This style is in vogue where he comes from, and works well.

Mr. Woodard condemned it as a barbarous fence. The barbed wire injured the cattle that might be abroad.

A member from Oshawa said that a gentleman tried this style of fence in that town, and that it was not the cattle that objected, but a certain class of the townspeople who stayed out a little late taking observations through inverted glasses.

A Stormont man gave a description of how they suffered in that county from deep snows and blocked up roadways (all through the snake fences), and said he would hail with pleasure the day when they could with safety to the crops be abandoned. There was nothing to hinder the coming about of this period if a law was passed that no one should allow his cattle at large at any time.

The President informed the Association that the discussion was not strictly in order, at least not according to the prepared programme, but it was of so much importance and so interesting that he could not find it in his heart to stop it.

The following resolution was carried: That in the opinion of this meeting every man should be compelled to look after his own animals, and that the President appoint a committee to investigate and report on the subject of fences at the next winter meeting.

The President named the following gentlemen as members of the committee:—Messrs. Beall, Bucke and Dr. Watt.

On motion the meeting was adjourned till 10 a.m. next day.

Second Day—February 19.

The Association resumed at 10.30 this forenoon, the President presiding.

There was a full attendance of members.

The President said that the Association had yesterday welcomed amongst them Col.

Brooks, of Wyoming, N.Y., and he would now ask that gentleman to step forward and take a seat on the platform. Col. Brooks thanked the President for the compliment, and took a seat as requested.

Raspberries.

Mr. Smith, of Drummondville, read an excellent paper on "Raspberries," which was very well received. The closing sentence or two are :—It seems to me that here is a field not only for our hybridist, but for the enterprising sons of fruit growers and farmers. All of our fine fruits originated from seeds, and the raspberry is very easily grown. Then why not, by a judicious selection of seeds from good varieties grown near each other, or by a careful hybridizing, produce something as good and hardy and lasting among raspberries as there is among other fruits? and if we would enjoy this fruit at all we have got to work for it, and attend to its cultivation, for as the country gets cleared up the wild berries disappear. Besides, it pays ; not only as market fruit, but it will pay any man who has a family and an acre of ground to grow it for his family, for he cannot find, in its season, a more delicious or beautiful fruit than the raspberry.

A vote of thanks was passed to Mr. Smith for his paper, and some discussion took place thereon.

Messrs. Saunders, Roy, Switzer, Arnold, Smith, Bell, Burnet, Brooks and others took part in the discussion, which soon swayed from raspberries to grafting apples, pears, etc.

About half-past eleven o'clock Mr. Dempsey called attention to the fact that the Association was getting away from their text, and made a few interesting remarks on raspberries. He endorsed what Mr. Smith had written about certain varieties.

Vegetables.

It was moved by Dr. Watt, seconded by Mr. D. W. Beadle, That the President appoint a committee on vegetables of recent introduction, to make observations during the summer, and report at next winter meeting.

Mr. Beadle thought it was important that more interest should be taken in the production of vegetables. He urged the appointment of a committee as suggested in the motion.

Dr. Watt favoured the appointment of such a committee, who should prepare a critical report upon the best varieties.

The resolution was carried, and the President appointed Messrs. Page, Taylor, Hood, Bucke, Biggar and Dempsey as the Committee.

New Fruit.

Mr. Smith suggested the appointment of a committee on new fruits, and the idea was favourably received.

The following were selected as the Committee :—Messrs. Allan (Chairman), Dempsey, Smith, Arnold, Gott, Saunders, Holton, Morris and Beadle.

It is understood that the several members shall write their observations to the Chairman, who will prepare the report.

Yellows in Peaches.

Dr. Watt moved, seconded by Mr. Pettit, That a committee be appointed to draft a bill, to be presented to the Legislative Assembly of Ontario, on the best method of eradicating the disease called yellows in peaches, and further, that a deputation of this Association be named to present the same, and urge the necessity of Government aid to help the orchardist to stamp it out.

A discussion followed. The cause of the disease, and the remedy, were again fully considered.

Mr. A. H. Pettit, President of the Grimsby Fruit Growers' Association, was requested to speak, and he responded with a few remarks.

The resolution was carried.

The President named the following as a committee:—The President and Messrs. A. H. Pettit, Roy and Saunders.

Nurserymen and Amateurs.

Mr. Saunders moved, seconded by Mr. Bucke, That in the opinion of this meeting it is desirable that the professional fruit list in the prize list of the Provincial Association be abolished, and that there be one general fruit list, open alike to professional and amateur fruit growers.

Considerable discussion followed, the opinion being expressed that the nurseryman was now at a disadvantage in competing with amateurs. It was demonstrated that many amateur fruit growers (so called) were in the habit of going through the country and obtaining varieties of fruit by whatever means they could, and exhibiting them as their own growth.

Dr. Watt of Niagara, Mr. Biggar of Winona, Mr. Pettit of Grimsby, Dr. Burnet, and several others, gave expression to their opinions, and advanced some clever suggestions.

Mr. Saunders stated that he was prerfectly willing to withdraw his resolution. There appeared to be a diversity of opinion on the subject.

The matter was dropped for the time, and the meeting adjourned till 2 p.m.

Afternoon Session.

The Association resumed its session at 2 p.m.

Mr. Anderson brought up the subject of apple pullers, packers and parers, and thought the matter should be discussed and the best practical means made generally known. In reply to a question, he stated that he always pressed his apples well into the barrels, and, though the sides might be a little bit bruised, they never rotted. The object was to have them solid in the barrel so that they would not be injured by the barrel being rolled.

Mr. Beadle referred to the apple picker introduced by Mr. Anderson, and said he did not approve of it at all. He thought the only practical method was the old one of doing it by hand. He went on to speak of packing. He agreed in a measure with the method mentioned by Mr. Anderson, but was more in favour of a plan adopted by an American friend, of wrapping the apples in tissue paper and packing them in layers of bran or other similar substance. Packed in this way they would bring a price in the proper market which would fully compensate for the additional trouble.

Mr. Wright, of Renfrew, urged upon sellers the importance of honesty in packing, so that none but good apples should be put in the barrels.

Several gentlemen addressed the meeting on the subject, and it was shown that though, unfortunately, some people were in the habit of putting bad apples in the middle of barrels, yet it was an undoubted fact that the apples this season were almost all of a bad keeping quality, and the shippers could not be accused of any dishonesty. The idea of "sweating" in apples was opposed by some. Some of the members spoke against the plan of packing in chaff, as the moisture would affect the apple. Different varieties of apples were mentioned, and the effect upon them of the method of packing now used.

Mr. Wright said, in reference to the Rhode Island Greening, which had been noticed to assume a brown colour after the 1st February, that he would next season experiment on two barrels and submit a report of the result to the Association.

After further discussion,

Mr. F. Anderson moved, seconded by Mr. Thos. Beall, That the Provincial Association be requested to give prizes for the best apple-puller, apple-packer, apple-parer and apple-dryer, and that the Directors of this Association see that the above be carried out and tested. Carried.

Apples.

Mr. P. C. Dempsey presented a paper on summer varieties of apples, giving their appearance, quality of soil required, nature of tree, size and other particulars. Among others he mentioned the Early Harvest, Red Astrachan, Benoni, Primate, Colvert, Duchess of Oldenburg, Gravenstein, St. Lawrence, Beauty of Kent, Norton's Melon, Fallawater, Baldwin, Hubbardston's Non-such, King of Tomkins County, Northern Spy, R. I. Greening, Golden Russet, Westfield Seek-no-Further, Ben Davis, and some others. The paper was listened to with great interest.

On motion of Mr. Roy, seconded by Mr. Gott, a hearty vote of thanks was tendered to Mr. Dempsey.

Mr. Gott, of Arkona, Lambton County, referred to the statement (in Mr. Dempsey's paper) that the Northern Spy tree was tender, and the bark liable to crack and canker. That was something unknown in this section of the country.

Mr. Dempsey said this statement was made from experience gathered in Prince Edward County.

It was suggested by some of the members that too much care was taken of the orchards, and that the trees were spoiled in many instances by being too freely manured.

Fruit Committee.

On motion, Mr. Allan was placed on the Committee on New Fruits.

Shorthand Reporter.

Mr. Bucke moved, seconded by Mr. Beall, that the Directors be requested to engage the services of a first-class shorthand reporter to take down the discussions at the next winter meeting, to be submitted to a press committee before publication.

Moved by Mr. Anderson, seconded by Mr. Switzer, that this Society does not need a special reporter to report the proceedings. Lost.

The original motion was then carried.

Niagara Grape.

Mr. Woodard requested permission to speak. He cautioned the Association and all its members against buying from any person the Niagara grape, as no one but the Niagara Grape Company, of Lockport, had that grape, and he would be glad to welcome all the members of this Association to the Company's grounds. On behalf of the Western New York Horticultural Association he extended a hearty invitation to come over to the next meeting of that Association. His remarks were hailed with applause.

Dr. Watt moved, seconded by Dr. Bell, that a vote of thanks be tendered to our visitors from the United States for their valuable assistance at our meeting.

The motion was carried by a unanimous standing vote.

Mr. F. Anderson referred to the very great interest taken by Chief Johnson of the Six Nation Indians, and he took pleasure in presenting the Chief with the apple-puller he had shown to the Association.

Chief Johnson made a suitable reply, in the course of his remarks referring to his present pleasant relations with the people of the neighbouring Republic.

Mr. Woodard gave Chief Johnson a special invitation to go over to the next meeting of his Council on the fourth Wednesday of next January. (Cheers.)

Mr. Allen moved, seconded by Mr. Beall, That the thanks of the Association be tendered to the reporters of the city press for the very excellent and accurate reports they had given of the proceedings and discussions of this meeting. Carried.

The motion was acknowledged by Messrs. J. C. Buchanan, of the *Times*, and A. B. Wood of the *Spectator*.

Mr. Roy moved, seconded by Mr. Dempsey, That the thanks of the Association be

tendered to the Mayor and City Council for the use of the commodious Council Chamber for this meeting. Carried.

Dr. Bell said he did not know whether it was customary, but he would move a vote of thanks to the Railway Companies for their kindness in granting reduced fares to members attending this meeting.

Dr. Watt seconded the motion, which was carried.

On motion the meeting then adjourned.

REPORT OF COMMITTEE ON CULTIVATED FRUITS.

Apples shown by P. C. Dempsey, Albury.

LORD BURGHLEY.

From imported trees, of medium size, dark reddish colour and attractive in appearance, of fine flavour, though a little over-ripe; fruited for the first time this autumn, and appears to be very desirable as a winter market fruit.

BEN DAVIS.

Very handsome specimen, bright high colour, well grown, and an excellent keeper.

POMME D'OR.

A yellow spotted apple, makes a good table decoration, and is well esteemed as a dessert fruit.

MARGIL.

Over-ripe at the present season.

Also several imported varieties were shown of various qualities, but were not named.

ORDS APPLE.

Tree imported from Ireland, apple of fine size, russety red colour, of good flavour.

PEARS.

Mr. P. C. Dempsey also showed the following varieties of pears :—"Diana de Hiver," "Vicker," "Duchess de Bordeaux," "Lawrence," "Mount Vernon," "Beurre d'Anjou."

Mr. A. M. Smith showed a specimen of the "Lawrence" pear.

P. E. BUCKE,
J. S. WOODWARD,
H. M. SWITZER.

REPORT OF THE COMMITTEE APPOINTED TO EXAMINE SEEDLING APPLES.

Sweet seedling winter apple shown by John H. Ramer, of Markham; a large apple resembling Sweet Bough, but out of season now, and we are unable to report on merits.

Sweet apple shown by Mr. A. M. Smith, of Drummondville; the flavour is good, colour green, with blushed cheek and deep eye. We cannot decide that this is really a seedling. It is in season now, and is a pleasant apple to eat, and evidently a good cooker.

Two seedlings, very similar in appearance, shown by Mr H. J. Lott, of Sidney Township, County of Hastings, somewhat resembling St. Lawrence, flesh yellowish, slightly sub-acid but with nothing special in merit.

A tart seedling, shown by Mr. George Cox, of Goderich Township, County of Huron. It is handsome, bright yellow, with blushed cheek, flesh firm. This apple will keep well into July.

Dessert Russet, supposed to be a seedling, shown by Dr. Watt, of Niagara. Being past its season, we cannot speak clearly as to merit. Flavour seems pleasant, grain fine.

Another Desert Russet, shown by Dr. Watt, resembling the S. P. Grise in appearance in some points. It lacks in character; sweet and mild in flavour.

Seedling shown by Messrs. Day and Dempsey, of Albury, large greenish splashed cheeks, flesh firm, very slightly sub-acid and pleasant, possessing more merit than a majority of seedlings of this class.

Another seedling shown by the same firm, smaller, similar in appearance to the last, but inferior in flavour.

Alex. McD. Allan,
A. M. Smith,
W. Holton,
B. Gott.

INTERESTING PAPER BY MR. JOHN A. WARDER, OF NORTH BEND, OHIO.

"On Planting Trees Along Our Roadsides for Shelter, Shade and Ornamentation—What to Plant, and Benefits of Such Planting."

The following interesting paper on the above subject, by Mr. John A. Warder, President of the American Forestry Association, North Bend, Ohio, was read by Rev. Dr. Burnet :

My Dear Mr. President, —At your earnest request, backed by that of your worthy "Directorate," but with great diffidence and hesitation on the part of one who is so much of a stranger to your surroundings, is this effort undertaken.

The crowd of duties, too, devolving upon him toward those who are nearer to him, who may, perhaps, claim to have rights pertaining to the members of his own household, would naturally prevent him from transcending the limits of his special bailiwick ; but, fortunately, all this was provided for anticipatively by those who applied the title American to the Society for the Promotion of Forestry in our Country—they desired to gain the advantages to be derived from your co-operation ; they wanted to be free from the "pent up Utica" of their own more limited area ; they wished to gather information from the length and breadth of the continent—hence their officer is your servitor as well as theirs.

Allow him, therefore, to come among you and address you under the broad ægis of an American, and as one who is ready to judge you all by the specimen members you have so willingly sent over to our side upon various occasions, and who have always so nobly represented their fellow-citizens of the Dominion, that the names of Burnet, Dougall, Beadle, Arnold, Saunders, and those of your neighbours, Jas. Brown, Chas. Gibb, Henry Evans, and others in the Provinces, are familiar as household words.

Yes, my friends, the scope of Forestry opens a problem of continental proportions, and hence, in the various countries of Europe, though each State and Kingdom enacts its own laws and establishes its own customs and usages for the management of its woodlands, and though these may differ materially, as do the results, in better or worse condition of the forests, even there the great questions are admitted to be continental, and these are referred to the famous meetings of the International Congress of Foresters.

But, after all, why should we address our friends as "over the way"—what is in the way, but an imaginary line, a mere politico-geographical line that is no broader than the spider's slender thread, which is supposed to separate those of us, here at home, who reside in the several commonwealths of our broad Union ! You and we boast of a common ancestry ; to great extent we use the same language ; in our customs and religion, in our pursuits, studies and interests, we have much in common, and in the question of forestry, we should certainly be united, since this involves the consideration of problems that are continental in their scope and import.

In coming over the border to discuss what is so essentially a home question, another and serious impediment arises, and this is a want of familiarity with your necessities and knowledge of your resources. The trees that may be best adapted to your soil, climate and tastes may be very different from those af another country that is differently situated, so that any indications that may be made must be based upon general principles, and the scanty observations that have been afforded by some very limited and hasty journeys through the Dominion.

And now, then, after having disposed of one difficulty to our satisfaction, having opened the gate, as it were, to your country, let your courteous invitation be graciously accepted, while we proceed to discuss the topic before us, "The planting of trees by the waysides, for shelter, shade, and ornamentation." This is a question which can hardly be considered debatable by any one who loves trees, and yet we not unfrequently meet those who oppose the proposition, nor are their objections to the practice altogether devoid of reason.

No one can have seen the long miles of avenues of various trees that are found beside the public highways of many parts of Europe without expressing his admiration for the forethought of those who planted these trees in the time long ago. To the pedestrian, sauntering at his leisure in the survey of those lands, if a stranger, or to the native citizen intent upon his errands from place to place, and especially to the masses of soldiers, heavily encumbered with their accoutrements, while making forced marches, the refreshing shelter furnished by these continuous *allees* of umbrageous shade must indeed be most grateful.

In planting avenues there is room for the exercise of taste, and here we need the experience of others to guide us; nor have the exemplars just now referred to, always proved entirely satisfactory, and many of the long *allees* become monotonous, and perhaps tiresome by their sameness, and by the stiff formality of the trees employed, or by their peculiar treatment. This is particularly apparent when the Lombardy poplar is used, as it is in some countries almost exclusively used, for many continuous miles, and especially when, to keep it within bounds and at the same time to make it furnish successive crops of fuel, it is cut as a pollard and chopped off every few years. Another favourite tree, the horse-chestnut, has a very different habit of growth, being umbrageous and more grand, and when in blossom very beautiful, almost gorgeous, indeed.

In some parts of the country, particularly in the more retired roads of the agricultural regions, the wayside trees are almost exclusively such as produce eatable fruits—apples, pears, cherries or plums, especially the prunes in some parts of Germany. In this case, the rights of property are rigidly observed; their growing in the public highway does not make them public—they do not become public plunder. Where the fee of the land remains with the adjoining proprietor (as is almost universally the case in the United States, and perhaps also in Canada), the trees are planted by the owner of the land, and the wood as well as the fruit belongs to him. Where the land has been condemned by the Government, and taken for a sort of *King's Highway*, the authorities plant the trees, and their products are usually farmed out to contractors, who look after their own interests. In some provinces the income thus derived is applied to educating the children of the parishes, which is no mean incentive to the people to aid in their preservation, since it redounds to their own advantage. The moral effect is good, and seems to aid in producing a high-toned appreciation of the ethics of *meum* and *tuum*, worthy of imitation.

In northern regions, and especially in the northern portions of our continent, with its climate of extremes, we need shade in the summer from the fiery rays of the sun, and in the other solstice we also need shelter from the rude blasts of winter, and not unfrequently we require a barrier against the drifting snows. This condition of affairs may need some modification in the plans and in the selection of the trees to be planted for avenues.

The protection afforded by a single row of trees standing across the direction of the wind has been found to be very perceptible in our western prairies. This effect is greatly heightened by a shelter-belt of several rows, even while the plants are yet comparatively small, but a thick belt, or even a single row of evergreens, seems really to modify the climate by checking the winds.

One of the railroads traversing the broad open plain of Nebraska has devised a style of snow-shelters that promises to be very efficacious. This consists of a double or triple row of trees, set on the windward side of the cuts. It may be that the highways and railroads of other parts of the country will find it to their advantage to adopt this plan.

Even in the mild climate of Southern Ohio, the shelter of evergreens is found to be very acceptable by all who have an opportunity of enjoying them. In laying out and planting avenues it is well to select evergreens for the north and windward side of exposed situations, while deciduous trees are planted on the opposite margin. And just here it

may be well to consider the arguments which have been raised by the practical road masters, who object to the planting of trees on the highways. The shade even of the naked boughs of deciduous trees is sufficient to keep the winter's sun from melting the accumulations of ice as quickly as would be desirable, and at any season of the year the very shelter which trees furnish to ourselves from the cutting blasts of wind will also check the evaporation of the superabundant moisture that is so injurious to our common dirt roads.

Until we can have more perfect roads, constructed upon scientific principles, and made of some better material than that furnished by rich humose soils and tenacious, unctuous clays, such as are common in extensive regions, it may be well to keep the road-bed well thrown up for proper drainage and thoroughly exposed to the natural road masters, the sun and the wind.

But this may be considered a digression from the strict line indicated in the request of your Directors, who have asked for a paper on road-side trees and their planting for shelter, shade and ornament. An attempt has been made to respond to your first query, and as to the last there can be but one mind as to the æsthetic effect of trees anywhere, whether planted on the grassy slopes of the lawn, either in groups or singly, in groves sheltering and forming a background to the dwelling, even the most humble, in the broad o'erarching avenue of approach, and also on the wayside of the public highway, trees are and always must be ornamental, if properly handled and well managed.

Referring to your commission, Mr. President (whose expressed wish is accepted as a command), it appears that you further ask, what to plant. Now you are coming to the point that must tax the practical knowledge of your respondent; no glittering generalities as to deciduous trees or evergreens, nor as to the broad-leaved or the needle trees, no æsthetic remarks as to the beautiful, in form or colour, tint and shade, strict or spreading, pyramidal or weeping, will now be in order. You ask the broad question: What shall we plant to shelter, to shade and to ornament the highways of the Dominion? And, unfortunately, you have proposed this question to one who must confess his ignorance of the kinds that are best adapted to your peculiar soils and climate, and to one who fortunately does not know what species are to be found in your nurseries, so, at least, you cannot bring the charge against him that he is putting anybody.

Your respondent, therefore, is necessarily thrown back upon his personal acquaintance with these vegetables themselves and their greater or less ability to withstand a rigorous climate and the abuse to which they may be exposed.

Beginning with the evergreens, so admirably adapted to furnish shelter, which is your first requisite, the hardy native evergreens of our continent are to be preferred for all large planting to those which, at great expense and pains, have been brought from foreign lands, too many of which, after trial, have proved unsatisfactory, and have to be cast aside with the ignominy attaching to that which is "far-fetched, dear-bought and little worth."

Spruces.—The white and black, *Picea* (Link), *alba* and *nigra*, are sturdy northrons, having a beauty all their own, and often assuming quaint forms of great attractiveness and putting on tints of peculiar colours.

The Norway spruce, *Picea excelsa*, though and imported species, has proved itself a good immigrant in all parts of our continent where it has been planted. It is a noble tree, of very erect habit and conical form, that rapidly assumes large proportions. This tree is entitled to a front rank in avenue, wind-break or grove, and furnishes fine timbers for architectural and naval construction. The young trees are now so abundantly furnished in America that it is no longer necessary to import them from the nurseries of Europe.

The spruces of the Rocky Mountains, though still comparatively rare, deserve a share of your attention, especially the *Picea pungens* (*Engelm*), formerly called the *P. Menziesii*, the silver spruce of those mountains; the *Picea Engelmani* and the *Pseudo-Tsuga Douglasii*, formerly the *Abies Douglasii*. All these trees are very beautiful; but you must be warned not to import them from Europe. Look to the Rocky Mountains themselves and not to the Pacific coast, as the original source of supply of these trees; nor need you look beyond the United states. (Messrs. R. Douglass & Sons, Waukegan, Ill., have grown

these plants in quantities.) This matter has been thoroughly tested in the valley of the Mississippi, considerably to the south of your valley of the St. Lawrence, and the western coast trees have failed.

While considering this section, the hemlock spruce must not be overlooked. The *Tsuga Canadensis*, formerly *Abies*, is one of your most beautiful native conifers, and will probably succeed nearly everywhere. Though not so valuable a timber tree as many others, it is one of the most beautiful when well exposed upon a grassy lawn or springing from a mass of native rocks. Its colour is supremely lovely and holds well. Planted thickly it makes a perfect screen and shelter hedge, that bears the shears admirably, and when it attains full size as an avenue it furnishes the perfection of a "dark walk."

The balsam fir, *Abies balsamea*, is very abundant in many parts of your country. Its deep green foliage, and its compact, upright habit, are much admired, especially when young, and it is a universal favourite with those who purchase evergreens to plant about their homes. This species would be useful for shelter in exposed portions of the roads through your country.

The European silver fir, *Abies pectinata*, is a more beautiful and a nobler tree, but it is no favourite with the nurseryman, especially in America, because it requires a long period of "schooling" before it can be induced to produce a strong leading shoot, after which it grows rapidly enough. The beautiful arrangement of the deep green foliage of this fir, which is very persistent, lasting several years, makes it dense and very desirable, and yet it occasionally suffers in the winter, and should have a sheltered situation.

The firs of the Rocky Mountains are particularly desirable, but perhaps they are not yet sufficiently tested for general planting. They should be tested with you, however, and at once. Who will undertake the good work?

Among foreign firs that known as Nordman's has been most satisfactory here, and bore our last trying winter better even than the native hemlock spruce.

The arbor vitæ, *Thuja occidentalis*, though it has merits as a timber tree of the second class as to size, is very ornamental, and is especially useful as a shelter. Bearing the shears or knife well, its especial value is for making a dense screen and hedge.

The white cedar, with which the above plant is often confounded, is the *Cupressus thuyoides*, a valuable tree, but one which has its range so much farther to the southward, it can hardly be recommended for Canada, unless you know it to be indigenous to your region. It is known to exist upon the northern lakes.

The red cedar, *Juniperus Virginiana*, is a most hardy tree of very wide range by the meridian as well as by the parallels of latitude, crossing the continent in both directions. Though so common as to be considered vulgar, and certainly less beautiful than many others, it is exceedingly valuable to the planter, and has well been called the poor man's evergreen. Its great value as a timber tree is only attained with age, for though it grows rapidly, there is a large preponderance of the white or sap wood in young trees. It is useful to plant for shelter screens, and will subsist on very poor and rocky soils.

Pines.—The pines, however, furnish our great supplies of lumber, in the northern forests especially, and among them you have some of the very best for your planting, which should be largely propagated for their perpetuation to supply the future necessities of the country.

Queen among these is the white pine, *Pinus strobus*, doubtless too well known among you to require a single letter of introduction, and yet it cannot be passed without remark as to its extreme grace and beauty, either singly or in groups upon the lawn, with its horizontal limbs clothed with soft and yielding leaves of glaucous hue resting upon the grass. In the forest or ancient avenue its tall shafts always arrest the attention of the traveller. This tree was taken to Europe in 1705. It is there known as the Weymouth pine, and noble specimens are to be seen in many parts of Europe, that were distributed by Lord Weymouth. In Bavaria it has become so nearly naturalized that it is reproducing itself by self-sown seeds as in its native forests.

By all means plant the white pine, and you will be much better rewarded than by its more beautiful cousin from the Himalayas, the *Pinus excelsa*, which is so grand a tree in Asia, but has not proved entirely satisfactory upon this continent; perhaps its Aryan countrymen might prove equally unsuccessful if brought here and placed in competition

with the Anglo-Saxon race born on the soil. The Norway pine, or red pine, *Pinus resinosa*, is another of your noble northern trees, producing a more resinous timber than the preceding. How it ever received the cognomen Norway is a mystery in nomenclature, as it is a veritable American, with no analogue in the great northern peninsula of Europe. Indeed, it more closely resembles the Austrian pine of the southern portions of that continent. To this, however, the red pine is a very superior tree for us and for you, whether planted for shelter and for ornament, or for its ulterior use as timber; indeed, the foreigner is fast losing its prestige among planters, and even in its home among the Styrian Alps it is very capricious in its choice of soils and aspects: it may be found on one slope of an elevation and not a tree of this species is to be seen when you cross the apex of the same ridge.

You are advised to plant the red pine largely without fear of disappointment. The growth of young trees is very satisfactory, and excels that of the Scotch and Austrian, though perhaps less rapidly aspiring than the white pine.

The grey pine, *P. Banksiana*, is another of your natives, and as such ought to have a place in your collections, but like the *P. Rigida* and *Mitis* further south, and the *P. Inops* of New Jersey, they are surpassed in excellence by the two first named, the red and the white.

The famous pines of the Southern States of the Union cannot be recommended for your plantations, nor, indeed, for ours, in latitude 40 degrees, nor can we expect to succeed to our satisfaction with those from the Pacific slope, nor from Mexico, any more than with the pines of Southern Europe, much less so with the conifers from Australia, Africa or South America, so far as known.

The Scotch pine, *Pinus sylvestris*, and the Austrian, *Pinus Austriaca*, have already been alluded to. They have their merits, and will be more largely planted in America for timber than for ornament. The former is largely grown in Germany, especially for its fuel, on the sandy plains and foot-hills of moderate elevation. Its rotation or period is from sixty to ninety years.

The writer is well aware that in this very brief sketch he has omitted all mention of a host of evergreens, conifers and others that crowd the catalogues and nurseries, which require volumes for their description, and which deserve, for their merits, the commendations that have been bestowed upon them. Many of these are shrubs, and though very appropriate for the lawn and even for the garden, as some of these may be, especially the new class of *Retinisporas*, *Biotas*, *Junipers* and many others, your queries were particularly launched at trees, and those adapted for planting on the road sides.

The consideration of all others, the possible and the impossible, may, therefore, well be handed over to the discussions that will naturally follow the reading of this paper and be carried on by your very intelligent fellow-members, who are doubtless *au fait* in such matters.

This brief analysis of the class of evergreens thus presented to you gives but a few trees that can be heartily recommended, but that small selection may be double-starred, as we say in pomological lists.

Let us now turn, in this very hasty sketch, to the deciduous trees, which are crowding around for notice, and it is feared your patience will yield to the strain upon it, and therefore the pen must be started on a double-quick to accomplish the march through the dense sylva before us, touching only upon those of the most hardy and most valuable character for the purposes indicated in your query of what to plant, and leaving entirely out of sight the corollary suggested respecting the benefits of such planting, supposing them to be self-apparent.

Deciduous Trees.

Poplars.—Among the most hardy and the most rapidly growing trees are the poplars and willows, all of which may be multiplied by cuttings that anybody can prepare and plant. The native cottonwood is one of the largest, and will very quickly produce a shaded avenue. In some situations it may prove desirable. Of this tree the species *Populus Canadensis* will be perfectly hardy.

Populus grandidentata, the Michigan poplar, grows rapidly and makes a fine shade, blooms very early and holds its leaves of dark green until late in the autumn. It is objected to this and all the aspen tribe, next to be mentioned, that they sucker profusely, and are thus unsuitable for planting on the lawn, near a garden, or on the roadside next to cultivated lands.

The Abele, or silver poplar, the *Populus alba* of Europe, with its many garden varieties, are much admired on account of their green and white foliage. They grow very fast and make a good shade. They attain a large size very soon, and, for certain purposes in the arts, where soft wood is needed, the timber has its value. The trees will endure any amount of abuse, and are therefore adapted for planting in school lots and other public places.

The quaking aspen, *Populus tremuloides*, is a hardy northern plant, and forms a small or middle-sized tree, with little claim upon our attention. It must be familiar to you in every part of the Dominion. Scarcely worthy of cultivation for our purpose, and yet in low grounds it might be adapted for a street tree.

The Canada balsam, *Populus balsamifera*, is one of the hardiest of the tribe, growing in the extreme north, and everywhere within your borders. Like all its fellows, it is readily propagated by cuttings, and has thus been disseminated to a considerable extent southward. It cannot be admired, however, for any special grace or charm, beyond its hardiness, facility of propagation, and that it is a tree. In the valleys of the Rocky Mountains this species is represented by the willow-leafed balsam, the *P. angustifolia*, (James).

The Lombardy poplar, introduced from Europe, has been widely planted in America, and for a street tree it has some merit in its tall strict habit, so that it does not offend the road master by its shade. Though a striking object in the landscape, whether in formal rows of avenues, or as the spring centre of a group, it is not a favourite when largely planted, but is interesting botanically and horticulturally, and perhaps historically and mythologically also. Though long considered a species and called *Populus dilatata*, it is now believed to be only a sport, of peculiarly erect form, from the *Populus nigra* of Europe. In a horticultural aspect this tree is very interesting as bringing evidence of the possibility of multiplying plants indefinitely by cuttings, for this was common in Italy before the days of Ovid, the Latin poet, and it still prevails in all that region as the favourite avenue tree. Botanically it is the staminate form, the male of a dioecious plant, and has never been known to seed. Mythologically Ovid makes it the memorial of the unwise and unfortunate Phæton, whose ambition exceeded his skill and ability to drive old Phœbus' chariot of the sun, and whose temerity was punished by Jupiter's thunderbolts, that hurled him headlong into the river Po, beside which he was allowed to rise as the poplar of Lombardy.

Maples.—The maples are all of them worthy of more consideration for our purpose. On low grounds, and beside water-courses particularly, the common silver maple, *Acer dasycarpum*, may be recommended, especially for its thriftiness, its rapid growth, and broad shade; though not so fine a tree as some of its family, the qualities above named, and its cheapness, ever make it a favourite.

The red or scarlet maple, *Acer rubrum*, like the above is also called soft maple. This tree is very ornamental both in spring and fall, on account of its brilliant colour of flower, seed, and autumnal foliage. The wood of old trees often furnishes the curled and bird's-eye maple. This tree is well adapted by its size for the street and for the roadway, but it is beautiful in the lawn also.

Another maple, very common in the Western States, and extending far to the northward, is the box-elder, or ash-leaved maple, the *Acer Negundo*, of which there are two forms; that of the Ohio River has bright green bark on the young twigs, while the northwestern form has the shoots of a purple hue and covered with a thick white bloom. The latter box-elder is much the better tree, and quite a favourite on account of its hardiness and rapid growth. For street trees it is commendable, for road sides it will serve a good purpose, but its timber has comparatively little value. It is dioecious, and the female tree has the better habit, being more snug and compact, and therefore to be preferred for planting.

The sugar maples are the best of this group, making majestic trees of great beauty, and putting on, in the autumn, the most gorgeous colouring. The rock maple, *Acer Saccharinum*, is so familiar as the tree of the "sugar bush" (or "camp" on our side), that it need only to be named, as its value is duly appreciated. There is another tree, however, and recognized as a different species, which must be noted, the black sugar tree, the *Acer Nigrum*, which is not so prevalent in the Eastern States nor in Canada as in the valley of the Ohio. This is noted for its broader foliage, and it usually has a more majestic form in the forest. The timber of both trees is equally valuable.

With such a wealth of maples it is hardly worth while to import the European forms.

Elms.—Elms will, of course, assert their claims upon our attention, and indeed they are worthy of a place in the grand avenue, as well as in the extended sweeps of the park and lawn. For this purpose the American white elm, *Ulmus Americana*, has the highest claim, though perhaps it is too large and wide-spreading at maturity for a road-side tree, except as an occasional object, serving thus as a landmark. This tree, however, varies wonderfully in its habit; it was a great favourite with Michaux, who introduced it to his fellow-countrymen of France, as the "most magnificent vegetable in America."

The red elm, *Ulmus fulva*, is not so noble and wide-spreading an object, but on that very account it is better suited to our purpose. It grows rapidly and furnishes a more valuable timber, which is more durable also, and much used for railway sleepers.

The rock elm, cork elm or hickory elm, *Ulmus racemosa*, is perhaps more beautiful as a tree than either of those named. It is also capable of yielding timber of great value and both of the last two are worthy of a prominent place in our timber plantations. They are both, presumably, in your native forests.

You, Mr. President, and some of your compatriots, will desire to plant the elms of Europe. Do so, by all means, as pleasant mementos. The common form of *Ulmus campestris*, long ago brought over to Boston Common, is perhaps better adapted to the road-side than any of our American species just now presented. The garden varieties of the European species have no especial merit or adaptation to the road side, but may be introduced into your parks.

Oaks.—The oaks of our country are quite varied, and have been too much overlooked by tree-planters, and yet wherever they have been introduced into village streets they have given great satisfaction. The European, particularly the *Quercus robur, pedunculata*, succeeds admirably in the temperate latitudes of our land.

The Holm-oak, *Quercus ilex*, of Europe, and grown in the south of England for its evergreen leaves, has not succeeded here and would not be likely to endure your winters. But you have a wealth of natives that are well worthy of your care, and it is to be hoped they will be extensively propagated and planted.

Among these the white oak, *Quercus alba*, the yellow oak, *Quercus castanea*, the swamp white oak, *Quercus prinos palustris*, and the burr oak, *Quercus Macrocarpa*, all furnish white oak lumber, and all are worthy of trial, first in your parks and lawns, perhaps also on the road-sides, and, if successful, largely in your forests.

While upon the oaks, let the opportunity be improved to urge you to adopt the old German custom of gathering acorns year by year, or whenever there is a crop. If not convenient to grow them in nurseries for future planting, still save the acorns and plant them anywhere in the woods. They need to be put into the ground at once, quite shallow, and they vegetate and continue to struggle on, even in the shade of other trees for an indefinite period, until at length, when the original forest is removed, they are ready to spring up, and soon make a valuable succession of woodland.

The red oaks constitute another class, characterized by the pointed lobes of the leaves, terminating in a bristle, and some with entire leaves, but all furnish an inferior kind of lumber.

Some of these are remarkable for their beautiful forms when grown singly, and for their exquisite colouring in the autumn. On this account the scarlet oak, *Quercus coccinnea*, and the pin-oak, *Quercus palustris*, are specially note-worthy, ay, and place-worthy too, by whomsoever has a vacant space on his grounds where he may desire to place a beautiful object. The former prefers a dry, the latter a damp, situation, and both may

be planted on the road side with a certainty that in a few years they will furnish a most gorgeous fringing to the highway during an autumnal drive; after the frosts have destroyed all your flowering plants the parterre in all its brilliancy will be replaced by these lovely oaks.

Ash.—The ash trees should not be ignored even in this hasty glance at our arboreal wealth. Here, again, the American trees will be found superior to the foreign. The white ash, *Fraxinus Americana*, is pre-eminent, though it may become at last too large for the road; still it should be planted, and then its valuable timber is available at any age, and trees grown thus exposed to the air furnish the very best lumber.

The green ash, *Fraxinus viridis*, on account of its smaller size and its clean, bright, shining and dark green leaves, will be a better subject for road-side planting. This tree is of rapid growth when young, is very hardy, being found far out on the exposed prairies of the northwestern plains, the outside tree, and one of the first to contend with the grasses for a sylvan supremacy: it may be safely recommended for your road and village planting.

Birch.—Your own native birches, and those introduced from Europe, should have their place secured to them on the road-side, where they will lend a charm by their graceful forms and peculiar spray and foliage.

Beech.—Of the glorious beech, *Fagus ferruginea*, not a word has been said. The "wide-spreading," so well named by Virgil in his opening line, describing the shady retreat of Tityrus, gives this tree a classical and a very attractive appearance wherever this character may be developed, but the broad sweep of the park is much better suited to its style than the narrow limits of the road side.

In European forests the beech, *Fagus sylvatica*, is largely cultivated, particularly on the lower lands devoted to forestry, and it is often introduced into oak plantations for the sake of filling up the interspaces, and thus forcing the oaks to produce tall shafts.

Two other trees have been jotted down upon the paper before me, as too valuable to be overlooked or omitted, and yet they have not been brought to the front, because of some uncertainty respecting their adaptation to your conditions. They represent two families which have not been included in the catalogue already given.

Cherry.—The roses may be now placed before you in the person of the wild black cherry, *Prunus Serotina*, a rapidly growing tree, probably hardy enough, which cannot fail to give you pleasure by its graceful form, its light and open foliage, its racemes of white flowers followed by abundant fruit for the birds. This tree would be very appropriate on gravels, if planted by the sides of your highways. The timber of this species has great value, and is highly prized for the inside finish of houses and for flooring, and is much more agreeable in its hue than the sombre walnut so universally employed for our furniture.

Magnolia.—The magnolias may be represented among you by the tulip tree, the white-wood of some parts of our country, and also, unfortunately, sometimes called poplar. The *Liriodendron tulipifera* is a magnificent tree of the largest size in its native forests. When standing alone or in avenues it rises majestically and clothes itself with abundant branches that are disposed in a regular conical form, and in early summer, after the broad and showy foliage is well developed, the points of twigs are bedecked with the large, bright coloured, tulip-shaped flowers, that make a grand show. Especially adapted for a lawn or for avenues, the tulip-tree is also well suited to the road side.

Walnuts and hickories have been purposely omitted because of their ill-adaptation to the purpose in view. In their proper place they are exceedingly valuable—so of many other trees of our own and other lands—which would require too much space, and their recital would try your patience, if, indeed, that has not already been exhausted.

APPLES—SUMMER VARIETIES.

Read at the Winter Meeting by P. C. Dempsey, Albury, P. E. County.

Early Harvest.—Tree grows slowly. When given good garden culture, on a loamy

soil, it will produce good crops of flat, yellow, acid apples, full medium size. It is one of the best amateur varieties.

Red Astrachan.—Tree, a strong, good grower on almost any soil. Fruit, large; colour, green, covered with red; very pretty; too acid for dessert; best of its season for market.

Benoni.—A good medium sized striped apple; succeeds in almost every soil. Good for amateur culture.

Primate.—A very good early amateur variety. Tree, apparently hardy; good growers; fruit full medium size; slightly conic in form; colour yellow, with a slight brown blush on the exposed side.

Colvert.—Tree, a good grower; perfectly hardy: succeeds in almost every soil. Fruit, large; liable to be blown off if left to mature on the tree.

Duchess of Oldenburg.—Tree, a good grower; succeeds in almost every soil. Fruit, one of the best of its season for marketing, on account of its attractive appearance.

Gravenstein.—Tree, tender, except when grown on a well-drained gravel or sandy soil. Fruit, one of the best for amateur or market.

St. Lawrence.—Tree, always healthy: very rapid in growth: produces an abundant crop each alternate year of large, conic, striped apples, that will attract the attention of any one passing it when on the fruit stand.

Fameuse.—Tree, always good in every variety of soil in which I have ever seen it growing. It makes one of the best stocks to graft tender varieties on. Fruit, very attractive when fair, but liable to spot in almost every variety of soil. Where it can be well grown it is one of the best for amateur or market.

Beauty of Kent. Tree, rapid in growth; does well in every soil where I have had the privilege of seeing it; produces large crops of enormously large apples. Colour, yellow, striped with red; one of the best for cooking and market. This variety has been overlooked.

Norton's Melon.—Tree, a slow grower, but seems to succeed in every place in which I have seen it. Fruit, good size; very attractive in colour and form. Any person once getting them is sure to want them again. John P. Williams, Esq., of Bloomfield, writes me that he intended to top-graft all of his Fameuse with this variety.

Fallawater.—Tree, a good, strong grower; always appears healthy. Productive of large green-coloured fruit, with a beautiful brown cheek.

Baldwin.—Tree, very tender; will only succeed in some few favoured spots. It must have a dry, light soil, and then it is better top-grafted on varieties that are more hardy; it is one of the best for market.

Hubardson's Non-such.—Tree, a good grower, and appears to be hardy. Fruit, resembles Ribston Pippin so much that we often find it competing in that class at our county exhibitions. I have seen only one plate of Ribstons in their class at a large exhibition and they got no prize.

King of Tompkins County.—Tree, a good grower; form, spreading and irregular, sometimes one-sided. Fruit, one of the best and most attractive of any of our winter apples, but in some localities I have seen it grown for years and not produce one specimen. It is very shy. I have experimented some with this variety. I grafted it in the top of another variety, having the two with branches mixed. In that tree it has fruited well for four successive years. Would it not be improved by planting in alternate rows with varieties that bloom at the same time?

Northern Spy.—Tree, tender. The trunk of the tree often cracks in the bark, and cankers. Frequently fails after producing two or three crops. Fruit, very fine in some localities, but I have seen in an orchard more culls than perfect specimens; often only fit for cider.

Rhode Island Greening.—Tree, a good grower; not always hardy; should have a well drained, light soil. In suitable soil and in favoured locality, it is one of the best for market.

Golden Russet—Is one of the best and most hardy trees we have. Succeeds in almost any soil, but only productive in favoured spots or localities, otherwise very shy.

Westfield Seek-no Further.—Tree, not very rapid in growth, but fair. Will succeed

in most localities. Fruit, always fair and attractive. John Graham, Esq., of Walbridge, places this variety at the head of the list for market or amateur.

Talman Sweet.—Tree succeeds where an apple tree can be grown of any variety recommended for home use.

Bailey's Sweet.—Tree grows well until it commences to produce fruit, then it should have good cultivation, like all other varieties that bear every year, otherwise they will exhaust themselves.

Ben Davis.—Tree, hardy ; good even grower ; commences to bear when three or four years from graft or bud. Succeeds best on a strong loamy or gravelly and deep soil. The roots seem to run straight down. Fruit, large, conic ; colour, green, striped and splashed with two colours of red. It will save until July with ordinary care, and command a better price that the Golden Russet. I would recommend parties to try this variety sparingly at first. In some localities the fruit is small and almost worthless. Mr. R. H. Potter, of Napanee, places this at the head of his list. There are many varieties that I have not placed on this list, either on account of not succeeding in many localities, or not sufficiently tested: Porter, Minister, Chenango Strawberry, Twenty Ounce, Yellow Bellflower, Red Canada, Roxbury Russets, Wagener.

I would recommend parties to try all of the new varieties that are being introduced, some of which, no doubt, will supersede some that I have placed on this list.

FOREST TREE SEEDS AND SEEDLINGS.

Read at the Winter Meeting by B. Gott, Arkona, Ont.

Gentlemen of the Fruit Growers' Association of Ontario :—

It was with much satisfaction that I learned, a short time ago, in a report of a meeting of this Society held in an important city of this Province, that notice was given to change the name of your Association from the one by which it has been long and favourably known, to "*The Ontario Fruit Growing and Forestry Association.*" I therefore introduce the subject of my caption without any further apology than this, that I firmly believe it to be a subject of immense importance to us and the people of this country at large. I may be allowed to state, however, in the beginning, that I do not intend to deal with this complex and tedious subject in minutiæ, but rather hurriedly glance at some few of the more practical aspects of it for our mutual edification and instruction. The extent and varied character of the subject, you will readily see, will at once forbid detail in the prescribed limits of these papers, which are intended merely to be brief and suggestive. We are undoubtedly laid under a heavy debt of gratitude to indefatigable and noble Dr. John A. Warder, of Ohio, for the friendly and patriotic spirit which has prompted the masterly and excellent paper on Forestry, which has just been read in our hearing by our President. Probably no nation with whose works we are at present familiar, has expended so much solid means or so much of the brain and muscle force of her people in the investigation and practical working of interests connected with her national forestry, as have the people of the United States. In witness of this I would merely refer you to the late elaborate and interesting

Report upon Forestry.

of 650 pages, issued in the year 1878, by the Department of Agriculture, at Washington, and edited by the Commissioner, Franklin B. Hough, of New York. This report is an everlasting boon to their people, and a monumental credit to the Government which caused it to be issued and distributed among a rising people, "unto whom we do well if we take heed," in these matters. The relationship and influence of forestry to our national fruit growing and our all important agricultural interests, are doubtless intimate and very precious, and are being daily scientifically and practically demonstrated, and better understood. It is now easily conceded among cultivators, that in the neighbourhood of only small blocks of forestry the fruit grower's chances of suc-

cess are comparatively certain and greatly improved; also that climatic aerial changes are less disastrous, the force of winds greatly modified, and the effects of intense heat or cold considerably and sensibly softened. The most regular and best possible amount of rainfall is best secured in such choice spots, these brightening to the largest possible extent the prospects of the patient fruit grower, and the laborious and painstaking agriculturist. Who will now plant an orchard or a vineyard without first pausing to secure a screen or shelter belt for his plantation? If these things are found to be so in the experience of men, with what scrupulous care and patriotic interest should we be found guarding our natural forests from destruction and death, and how intensely important should we regard any information relating to the propagation, renewal or preservation of forest growth. That the earth is so generally and so plentifully supplied in its utmost extent and its every recess with a profuse forest growth, for usefulness and beauty, is undoubtedly one of the richest of Divine legacies to ungrateful mankind. Conceive, if you please, the idea of a habitable world of the nature and dimensions of our earth, that is but a vast treeless plain. How utterly repulsive and forbidding! How devoid of gracefulness and beauty! How comfortless and wearying! and how totally unfit is such an earth as the residence of creatures such as we are.

On the contrary, how different is the scenery that greets us all around, as though the great Creator of all things had amply foreseen our greatest needs. Every country and island of which we have definite knowledge, if we except merely the great sandy plain in the centre of the "Dark Continent," and not inhabited by man, is more or less profusely covered by a rich and luxurious growth of natural forestry, just suited to the conditions of climate and soil, and to the urgent demands of the inhabitants frequenting those climates. How admirably is the earth furnished as the habitation of man! Perhaps no country in any climate on the broad surface of this beautiful earth has a native forest growth at once so extensive, so varied, so grand and so useful for the various and urgent needs of man, as on the extensive and inviting continent of America or the new world. Ontario, and even the whole

DOMINION OF CANADA,

very largely shares in the inherited wealth of these primeval and majestic forests. This is a coveted wealth that European countries wistfully look to in vain, and which they would doubtless prize even above the inexhaustible wealth of their fathomless mines. Yet, with what unexampled recklessness and slaughter, are we, as a people, treating those noble relics of the olden times that we never can replace. How inconsiderately are they fired and felled, and otherwise villanously destroyed. What sad and merciless havoc is annually made upon them for the base and meagre considerations of the present hour! How far from our serious thoughts of the future are the considerations of preservation, economical use, culture and propagation as applied to our forests! Even now in many open and wide sections of this fair and promising country the landscape is fast becoming stripped and treeless, and affording but little beauty to the eye or comfort to the home. The parching drouths of summer scorch the sparse vegetation, and the merciless, fierce and piercing winds of winter sweep perishingly over those denuded spots.

The serious consideration of this whole subject is to us, as well as to others, a matter of immense importance, and very soon we shall find ourselves compelled by merest need, to entertain it in detail. If something is not speedily and effectually done in the interests of our forests either in the shape of preservation or propagation and culture, we shall, before many years have swept their onward course over us, find ourselves compelled to forever inhabit

A DISMAL TREELESS WASTE,

and an unfruitful region. But to come closer and more immediately to the subject matter of my caption, allow me to remark, that by the words "Tree Seeds," I may also understand *slips or cuttings* used for purposes of propagation, as well as seeds properly containing the vital principle of vegetable action and growth. This you will at once clearly discern will open to us an immense and interesting field of investigation and inquiry,

that, treated in detail, would far outstrip the narrow limits of our present prescribed plan. We shall therefore, as we have before said, strive to be rather suggestive than profuse. The seeds of forest trees, although in many cases very inconspicuous and apparently unimportant, are nevertheless the ostensible and positive receptacles of tree life, and for their perfection and development the parent tree lives and blooms and dies. We must therefore regard the seeds as of the very first importance in the history of tree life, and as containing in themselves, in embryo, the essential parts of the future plant, exactly resembling in all essential respects those of the parent. Their nature and capabilities must be carefully studied, and in the management of them whatever would injure or destroy their vitality must be positively avoided, and whatever conditions will most readily and surely hasten and ensure their progress and development in life must be assiduously maintained. The seeds of different trees mature at different seasons of the year, when they must be immediately gathered.

This is done largely by persons well acquainted with the forests and who give much of their time and attention to them. It is therefore required of the forester, that he be a man of extensive and accurate knowledge, of large and well developed experience in the proper management of tree seeds, and that he maintain a sharp lookout for them at their natural time of dropping. Some tree seeds are very relishable and valuable as food to man, and also to many of the lower animals, birds, etc., and unless the forester maintains a constant and sharp look out for them, and is wide awake in his business, he will find to his disappointment that his chances are merely second-rate. Again, most tree seeds are found to germinate best immediately after maturity if properly disposed of in their homes in the earth. If this point is neglected and their coverings are suffered to become dry and hard, and their vitality impaired, their germination is sometimes prolonged and sometimes destroyed altogether. In the orders *Aceraceæ*, *Ulmaceæ*, etc., the seeds ripen in very early summer, and require immediate attention, and, as a rule, their seeds do the best if disposed of at once in the seed bed. The particulars relating to the keeping of the tree seeds are not generally well defined or understood. It is, however, evident that different seeds require different treatment, and the practice is frequently attended with considerable risk and danger to the life of the seeds. Large and correct experience is required to superintend this department, and nothing else can be well substituted for it. In a general way most of our hardy forest tree seeds are best preserved for short times in moderately fine sand, either dry or moist, in some cases one and in some cases the other, and out of the way of frost. This sand is to protect them from the disastrous effects of the atmosphere when allowed free access to them, as they are not at home in the air but rather in the earth. Although it is a good rule that tree seeds should be sown as soon as possible after maturity, yet it is sometimes impracticable to do so, and it is quite possible to keep them during the winter, and sometimes even for longer periods of time, by judicious management in preservation. The seeds are then sown as early in the spring as possible, as soon as the ground will permit of freedom of working and the weather has a promise of early growth. The ground selected for the purpose should be high, dry and thoroughly loosened and pulverized by frequent and deep stirring. If poverty of nutriment should be suspected in the soil of the seed bed it must receive, previous to seed sowing, heavy dressings of rich fertilizers, thoroughly incorporated with it. The best possible fertilizer for all general purposes is well decomposed and thoroughly mixed barn-yard manure, applied to the surface and thoroughly worked and mixed up into the soil, so that it may be rich and well stirred to the depth of at least eighteen inches or two feet. In our experience in locations for tree seeds, we have found a regular and somewhat steep northern slope, of say 25 to 30 degrees of inclination, to be a very favourable and beneficial exposure, and especially so if moisture is pretty liberally and naturally provided there. This we have found to be so for two especial reasons: first, the young and tender seedlings, as they are coming up, are in this way very much protected from the scorching and disastrous influence of our peculiar and intense summer sunshine; and, second, in our region of country the most of those exposures are found to possess a mild and very favourable coolness and dampness in the soil, that is very desirable, especially in the intenseness of summer drouth. If the beds are to be made on a small scale, they may be made in any convenient form, and of sizes to suit the convenience of the operator.

The seeds may then be carefully and thinly deposited in the well-prepared earth, and in rows twelve or eighteen inches apart, or, in field culture, two or three feet apart, and at a depth proportionate to their proper dimensions. After sowing and thinly covering the seeds, the ground should be thoroughly rolled, or carefully firmed by means of the spade or the feet. Without any delay it will be found advantageous as near as possible to imitate nature in the matter of shade for the young seedlings, and the whole surface of the seed bed may at once be shaded or protected from the influence of the sun. This is best done by means of fresh white cedar branches laid on frame work, and raised some three or four feet above the surface of the bed; the branches placed on just thick enough to admit only a portion of the radiant light. It is reported to be very interesting and instructive to witness the arrangements for shade over acres and acres of tree seedlings in the grounds of one of the largest tree seedling growers on the continent. I refer just now to those of Messrs. Robert Douglass & Sons, forest tree nurserymen, Waukegan. Ill., U. S. Their annual tree seed products amount to millions upon millions, and are liberally distributed over the entire country. It is not well to place those shades too high above the seed beds, neither must they be placed too low to ensure complete and free circulation of fresh air and to facilitate ready weeding and culture of the soil. Protection and shade are more especially necessary in the case of evergreen tree and shrub seeds, and many others are greatly benefited by it. Birds must also be closely watched, as they are very fond of tree seeds, and especially evergreens, and will readily dig them up and devour them, and if neglected all will be frustrated. Shading greatly helps them in their thievish work. During the whole time of the active growth of the young seedlings the frequent stirring of the soil must not be neglected, and the weeds must be carefully kept out, and in spots in the rows, where they are standing too thickly, judicious thinning would be a great advantage. If they are intended to remain where they grew during the winter, and should the ground contain surface moisture, they must be well covered down during this trying season, or they will heave out and be left high and dry on the surface. It is not well, however, to leave them in the seed bed more than one, or, at the most, two years, as their top roots lengthen and they are injured for future transplanting thereby. They will be ready at these ages if growth has been good, and satisfactory for permanent transplanting in nursery rows, three feet apart and two or more feet in the rows. Here further attention to pruning and culture must be kept up for a period of from two to five years, as the case may be, before permanently locating them in their final homes. The pruning necessary is simply the encouragement of a strong stem and a thrifty leader, and the formation of a good head according to the known habits of the tree. This pruning must be attended to annually as the circumstances of the case may demand. Sometimes frequent or annual transplantings are resorted to among nurserymen for the encouragement of an abundance of small fibrous or feeding roots. The practice is a very good one, and such trees so treated are usually more valuable, and finally transplant with the greatest ease and surety. The last and permanent planting may be done either in the fall or spring of the year, and on ground well and carefully prepared for the purpose. The plan of the planting must be carefully arranged before hand, and must be in accordance with the purpose which the trees are intended to serve, either for lawn decoration, fruitfulness, shelter or wind-break, or for extended forest culture and growth. The best results in transplanting for forest tree culture and growth will undoubtedly be obtained on well drained, rich and thoroughly cultivated soil, and the trees set at a distance of not greater than four feet apart, or at the rate of 2,700 trees to the acre. They may be here still thoroughly cultivated, either by hand or horse power, and during a period of time until they perfectly overshadow the whole ground; moderate pruning may also be kept up, and the trees will make a most surprising and satisfactory growth. In relation to the question of sorts, kinds, or varieties of trees to grow, tastes, requirements and circumstances greatly differ, but a sharp and intelligent view should be keenly had to ultimate usefulness and profit. For these purposes nothing can be better than our native, common Canadian forest trees, either for usefulness or beauty, though many admirable foreign varieties are successfully cultivated among us. The requirements of the cultivator once ascertained, the sorts of tree to gratify them are almost endless. I am afraid, however, that I am already greatly over-stepping the limited bounds assigned me in this paper

as my subject is now no longer seeds and seedlings, but trees of magnificent proportions, of stateliness and beauty. As will at once be perceived, I have not so much as glanced at the philosophical or scientific aspects of the subject, as these were beyond my control, but have contented myself with a simple practical statement of the question. The importance of the subject alone is sought to be placed in conspicuousness, as no glare of masterly ability is even attempted. I humbly trust I may hope that the importance of the project that I feel deeply interested in, viz., *Canadian Forestry*, may at once commend itself to the earnest attention and good judgment of the people of this beautiful and prosperous country, and that before many years shall pass we shall see many plantations of forest trees dotting the fair surface of our Canadian landscape.

Arkona Nurseries, February 18, 1880.

WHAT SHALL WE PLANT?

Perhaps there is no question that cultivators of the soil more frequently ask themselves, and no question more difficult to answer satisfactorily, than what will be most profitable and pleasurable for us to plant.

The person who has but a short lease of the land he occupies will give quite a different answer to this question from the person who owns the land himself and hopes to cultivate it so long as health and strength will permit, and looks forward to the time when, through the infirmities of age, he shall give up the old homestead to some promising son who will hand down his father's name to posterity. I shall not attempt to answer the question for the person who is a yearly tenant, but proceed to make a few suggestions to the owner of the soil.

In the first place, permit me to express my belief that there is a tide in the affairs of the cultivators of the soil; and the question of what to plant must be answered by Canadians of to-day quite different to forty years ago.

> Yes, forty years ago, I ween, through July's burning sun,
> Our shining rivers filled their banks for raftsmen's speedy run,
> And sloping hillsides, clothed with trees, invited August showers;
> Thus dale and hill, and plain and rill, were crowned with fragrant flowers.

Looking, then, at our position to-day as cultivators of Ontario soil, and comparing our position with other portions of the earth, I would say plant apple trees for profit, and still continue to plant until at least one-eighth of this portion of Ontario shall be covered with apple-trees.

This conclusion has been arrived at from the following considerations:

1. No portion of the earth can grow better apples than we can, and but a very small portion of the earth can grow apples to compare with ours.

2. Because a considerable portion of Ontario soil has, in the past, been devoted to the growth of wheat, and that this soil is now quite inferior for the growth of wheat to what it was when first brought under cultivation.

Then, looking at the prospects of the immense crops of wheat that will in the immediate future be grown in the North-West, and to the fact that a great portion of the North-West cannot grow apples, coupling these facts, with our promised railway facilities for shipping to our North-Western neighbours, has led to the above conclusions.

But let no one think of confining himself solely to planting apple trees, lest by so doing our orchards should be deprived of the summer showers. By all means let us plant our steep, sloping banks, and every piece of poor waste land, with some valuable and rapid-growing trees suitable for the soil and climate, not forgetting to plant a good row of evergreens of some kind around our orchards (Norway spruce would be my choice).

On some of our hill-sides and valleys the black walnut and hickory can be grown, and it would add much to the value and appearance of the farm if a few of these trees were dotted over it in different parts.

Thus far the question has been answered from a dollar-and-cent stand-point, but the question is equally interesting when planting for ornamentation and for the real pleasure to be afforded. Let me say a few words about planting for ornament. In passing through the outskirts of our cities, towns and villages, we often see large, and, in some respects elegant, mansions, that have cost the owners many thousands of dollars, but upon the grounds there is scarcely a tree of any kind to break the ostentatious glare from the road, or to protect it from the winter storm. Near by stands a small and unpretending cottage, with its quarter or half acre of land. In the front of the house stand three or four Norway spruce, or, if the cottage be very small and low, a couple of Austrian pine trees instead; a little dwarf mountain pine stands opposite the front window; a beautiful *Clematis Jackmani* climbs up a slight wire trellis on one side of the door, loaded for several weeks in the summer with beautiful purple flowers. On the other side of the door stands a luxurious Pipe vine, its dark green twining stem bidding defiance to twenty degrees below zero in the winter, and all summer clothed with dense foliage, each leaf measuring nearly a foot in diameter, and in July loaded with an abundance of perfect meerschaum pipes, sufficient in number to satisfy the most inveterate of smokers, and each pipe large enough (in the writer's opinion) to hold all the tobacco that any dozen persons should consume during the year. But few persons, one would suppose, could pass such a home without thinking of the words of Tom Moore:

"And I said, if there's peace to be found in the world,
The heart that is humble might hope for it there."

But let us go back for a few minutes to our expensive, naked mansion, that looks as though it had strayed from some stiff city block into the country, and got lost. But here it is, and in order to make the best of it let us put in a few clumps of Norway spruce, the number of the clumps, and the number of trees in a clump, depending upon the size of the grounds; a row of evergreen and deciduous trees along the front, consisting of mountain ash, horse chestnut, weeping birch, black spruce, white spruce, Austrian pine, etc., and a few hardy shrubs between the trees. The change for the better that will be effected by this simple, and at the same time the cheapest of all ornamentation, must be aparent in a few years to every person of taste.

The pleasure afforded by watching the progress of healthy growing trees, planted by our own hands aided by some loved ones, is very great, and it is questionable if any person with a particle of music or poetry in his soul can stand alone for only a few minutes beneath the branches of some lovely evergreen that he, with the aid of some dear departed one, had planted some thirty years ago, and listen to the strains of Æolian music in its branches, without being the better for it. And where, I would ask, is the son, worthy the name of a son, who would not under such circumstances exclaim:

"Woodman, spare that tree!
By my dear father's hand
'Twas planted in that spot:
Then, woodman, let it stand,
Thy axe shall harm it not."

And, as there is a desire implanted in the breast of most of us to be remembered after we are gone for some good that we have done, I do not know of anything so easy and so well calculated to accomplish this object as the planting of trees, and thus, as Longfellow says,

. . . "make our lives sublime,
And departing leave behind us,
Footprints on the sands of time."

CHARLES ARNOLD.

Paris, February 17, 1880.

RASPBERRIES.

By A. M. Smith.

Mr. President and Gentlemen:

It has been said that every man has some hobby to ride, and I believe it is just as true of fruit growers as of any other class of men. Take a Grimsby man, for instance, and his hobby would be peaches and peach growing; an Owen Sound man's would be plums; while an Oakville or Jordan man would ride strawberries, and some from other sections would prefer pears or apples, and a great many of our Yankee friends are just now astride of grapes. But my particular hobby is raspberries, and with your permission I will trot out my steed and endeavour to show some of his good points. My favourite colour for raspberries (as well as horses) is red or bay, though I do not dislike a good black, and I might endure a chestnut (say a cross between the two, like Saunders' Hybrids); but a cream (like Arnold's Diadem) is too tricky for me, and whites are too tender to stand the climate—but an explanation of this hereafter. I believe that the cultivation of this fruit, in this country at least, is but in its infancy, and that we are destined to see as great an advance in varieties, and in its cultivation, in the next ten years as we have in strawberries during the last. The main reason why so little attention has been paid to its cultivation heretofore in Canada is because of its abundance in its wild state. From the earliest settlement of the country to the present, and from the shores of Ontario to the remotest settlements of our Province, it has sprung up as it were spontaneously around the clearings and fences, and has been emphatically *the fruit* of the pioneer settlers; and even now the majority of our farmers, and many dwellers in our large towns and cities know little or nothing about it except in its wild state. Such people know as much about raspberries as a man does about Spitzenberg apples who has never seen or tasted anything but crab apples. I do not say the wild raspberry is not quite palatable when cleanly picked and fresh from the bushes. But the wild raspberries of our markets, picked by Indians and others, and brought in in pails—Well! they may do for syrups or raspberry vinegar, if one can do as the boys do when they drink new cider—forget all about the worms, decayed fruit, dirt, etc.—but compared with the Clark or Herstine, or even the Philadelphia, they would be like our wild plums beside the Bradshaw, Victoria, or Washington. I know not why it is so, but the majority of our farmers seem to have an antipathy to the culture of small fruits. They think it does not pay; they do not like to be bothered with them, and if they tolerate them at all they are generally left to the care of the boys or "women folks." But when they are on the table, covered with cream and sugar, or surrounded with the delicious pastry—which their wives know so well how to prepare—mind you, they are no way backward in disposing of their share of them. I have known them even to assist in gathering wild berries, travelling miles to get them. I have a vivid recollection of spending a day with my employer in the bush, the last season I worked on a farm, gathering black raspberries. It was so rainy we couldn't work out doors so we went berrying. I thought then, as I ever have since, that if there was as much time and trouble spent in cultivating a few choice varieties in the garden as there is in tramping through brush and wet after wild ones, farmers' tables would be better and easier supplied with these luxuries than they are now. As I remarked at first, my favourites among the raspberries are the red. My experience in the cultivation of them extends over a period of about twenty years—for the last ten years I have cultivated for market, and during that time I have tried quite a number of varieties, but have found very few that were profitable. Some are too tender to stand the winter; some too soft for shipping, others poor bearers, etc. Still a great many that are not profitable for market, on account of the labour it would require to lay them down for winter protection and tie them up again in summer, or on account of their propensity to sucker, or their being too soft to ship, would be very desirable for amateur cultivation, and would well repay a little extra labour. Among these I might mention the Franconia, Brinkle's Orange, Belle de Fontenay and some others. As a berry for general culture, the Philadelphia would, in my estimation, rank among raspberries where the Wilson's Albany does among

strawberries. It would be *the* berry for the million on account of its hardiness and great productiveness. Still it does not sell as readily or command as good a price in market as many others, on account of its dull, mouldy colour which gives it the appearance of having been picked a long time, and its quality is not up to some others. Size and colour are two great requisites in marketing any kind of fruit, and in most markets rank higher than flavour, but when all of these are wanting, it takes great productiveness to make a variety profitable, which quality, fortunately, the Philadelphia has. I think it will bear a third more than any variety I ever tested. The Highland Hardy is another hardy variety—a good berry, very productive, with a good colour, but unfortunately small, but with good cultivation pays well on account of its earliness. The Clark is one of my favourite berries, combining as many good qualities as any variety I am acquainted with. It is hardy, productive, large, bright coloured, and fine flavoured. Its only serious defect is it is too soft to ship far, but it is an excellent variety for a home market. The Herstine fully equals it in many respects, and, I think, exceeds it in productiveness, but the plants are not quite so hardy. If I was asked to recommend a variety for shipping a long distance I should say Brandywine, but it is small, and suckers so profusely, that I would not recommend it for anything else. For hardiness I should recommend the Turner, it is a medium sized berry, of fair quality, but it also suckers badly and requires a vigorous use of the hoe to make it bear well. The Naomi is another hardy variety, of good size and quality, somewhat resembling the Franconia, but with me many of the berries are imperfect, and are inclined to crumble to pieces when picked. In regard to new varieties, I am disappointed with many of them, and with a few well pleased. The Pride of the Hudson, which was introduced with such a flourish of trumpets on the other side, has not done well with me. I was also unfortunate with the Delaware. The Amazon is a second edition of the old Belle de Fontenay, and if any one wants berries in the fall, and has plenty of time to keep down the suckers, this is a good variety for them. It is quite hardy, of good size, and, with constant pruning, will produce a good crop early in the season also. With our home productions I am not quite satisfied. I had long been looking for, and hoping to find, a light coloured raspberry, of the character and quality of Brinkle's Orange, that was hardy enough to stand our climate, and when I first saw Arnold's Diadem in bearing, I exclaimed, "Eureka! I have found it!" I had seen the plants exposed, the previous winter, on the western slope of a hill, and knew they must be hardy, and here they were now, loaded down with delicious, cream-coloured fruit as luscious as Brinkle's Orange. I thought they were just the thing we wanted, and when I got a plant from the Fruit Growers' Association I prized it highly, and I took great pains in selecting and preparing a place for it, far enough from every other variety, so that I could be sure to keep it pure. Well, I planted it, and awaited results. The first season it did not make as much growth as I expected it would, still it threw up two or three pretty fair canes, from which I expected to get some fruit the next season. But I was disappointed—there were only a few straggling berries, and the most of them imperfect; but it made quite a number of good strong canes, and I consoled myself with the hope that it would do better next time. Well, the next season came, and there was some fruit set, and I watched it with a great deal of interest till it matured, when, to my utter amazement and disgust, it was about one-third red berries, the balance nothing like what I saw on Mr. Arnold's grounds. Do you wonder I call it tricky? I suppose it is some freak of nature, but I should like to have Mr. Arnold, or some one else, kindly inform me how to account for it. But I have not wholly given up my hopes of this variety yet; last spring I procured some more plants of Mr. Arnold, and am determined to test it thoroughly. And, by the way, the first time I saw the Diadem on the grounds of Mr. Arnold, I saw several varieties of red hybrids of his, which I thought were very promising; I hope Mr. Arnold will inform us if they continue so. In the fall of 1877 Mr. Wm. Saunders, of London, kindly sent me two plants of his hybrids—a cross between the red and black—which have been noticed in our Annual Report, and which the Society intend to send out to members next spring. I fruited them last season and was much pleased with them, although I do not think they will ever become a popular market fruit—their colour is against them; but for family use, particularly for canning and cooking, they are very fine, and they are enormously productive and very hardy. Mr. Bucke, of Ottawa, exhibited

canes at our last summer meeting, which had stood the severe winters of that section, and were loaded with fruit to the very tips ; and this is what we want—something that will stand the winter without covering. I have a pet of my own, which, though not a hybrid, I think is a cross between the Clark and Philadelphia (it was noticed in No. 8 of of the *Canadian Horticulturist* for 1878). It has the shape and habit of the Clark, the colour of the Philadelphia, and the flavour is about a mixture of the two, but it is larger and later than either, and fully as productive as the Clark. I have sent out plants to different parts of the country to have it tested, and if it proves superior in any respect to other good varieties I shall offer it for sale, if not, I shall throw it away. I do not believe in multiplying varieties unless you can make some improvement thereby.

In regard to black raspberries, I grow mainly for market the Davison's Thornless and the Mammoth Cluster—the former for its earliness, and because it does not scratch and tear your clothes, and the latter for its productiveness and lateness, which prolongs the season. The Doolittle and Seneca are also both good varieties. The "white caps," as they are called, such as the Golden Thornless and some others, are not worth growing.

I might remark, in regard to soil and cultivation, that almost any land that will raise corn will grow raspberries, providing the water does not stand around them in winter, though a sandy loam is considered the best for the finer varieties. The best crop I ever raised was on a clay loam, rather inclined to be heavy ; and I should plant those varieties that were inclined to sucker badly on a heavy soil, if I had it. I generally plant in rows, six feet apart, put the plants three feet apart in the row, and only allow four or five plants to each hill, keeping the other suckers hoed down. I pinch back the growing shoots when from two to three feet high, which makes them branch out and grow stocky, and saves the trouble of staking. I cultivate as early as possible in the spring, and get all the growth I can in the early part of the season, and cultivate as little as possible in the later part, and the wood will ripen up and stand the winter better than when a late growth is kept up by cultivation. I usually remove all the old wood as soon as the fruit is gathered.

It is unfortunate that some of our finest varieties, not only of raspberries, but other fruits (as well as other things), do not succeed in the northern portions of our Province without a great deal of trouble in the way of protection. But I see no reason why good varieties of raspberries cannot be produced that will thrive wherever the wild ones will, as well, at least, as the Fameuse, St. Lawrence, Pomme Grise, and other fine varieties of apples do.

It seems to me that here is a field, not only for our hybridists, but for the enterprising sons of our fruit growers and farmers. All of our fine fruits originated from seeds, and the raspberry is very easily grown. Then why not, by a judicious selection of seeds from good varieties grown near each other, or by a careful hybridizing, produce something as good, and hardy, and lasting among raspberries as there is among other fruits? And if we would enjoy this fruit at all, we have got to work for it and attend to its cultivation, for as the country gets cleared up the wild berries disappear. Besides, it pays, not only as market fruit, but it will pay any man who has a family, and an acre of ground, to grow it for his family ; for he cannot find, in its season, a more delicious or healthful fruit than the raspberry.

ON SOME DECIDUOUS TREES AND SHRUBS DESIRABLE FOR MORE EXTENDED CULTIVATION.

By Wm. Saunders, London.

There are quite a number of handsome and valuable deciduous trees and shrubs which endure our climate well, and which, if more generally known, would be added to the choice selections of many an amateur. The writer's intention, in the present contribution, is to refer to a few of these with the object of bringing them into more general notice. The statements as to hardiness are in some instances based on observations ex-

tending over many years, in others on the experience of the last three or four winters, with examples grown in the immediate neighbourhood of London.

The Flowering Dogwood, *Cornus florida*.—This is without doubt the handsomest species of the genus to which it belongs, and, while the other members of the family are shrubs, this aspires to the dimensions of a tree. When full grown it is a pretty little tree, from 16 to 25 feet in height, with large, ovate, pointed leaves, of a light green colour in spring, changing to a dark red in the autumn. The flowers, or to speak more correctly the involucres, which are perhaps the most attractive feature in this instance, expand early in May, before the tree is in full leaf; they are white, measure from two to three inches across, and sometimes cover the whole tree giving it a very gay appearance. The true flowers are grouped in little clusters in the centre, the surrounding involucrum producing all the effects of a large white blossom. Later in the season brilliant red berries appear, making it almost as showy in fruit as in flower. This desirable tree is a native of America, is found from Carolina to Canada, and abounds in all sections of the middle States. Along the Hudson River it is one of the gayest native ornaments in the flowering season. I had never met with it native in our woods until last year, when I was surprised to find in May a nearly full grown tree, covered with flowers, in the midst of a wood within three miles of London. I am not aware that it has been recorded before as native to this section. Young trees, from nurseries in the United States, have been growing on my grounds for three or four years, and have proved quite hardy. This species was introduced into Europe in 1731, and is much cultivated and highly prized in many localities there. Its profusion of white flowers in spring, and brilliant red berries and dark red foliage in autumn, show out well against a background of evergreens.

The Tulip tree, or whitewood, *Liriodendron tulipifera*.—In a paper read before this Association a year ago, I called your attention to the value of this tree for ornamental purposes. Its importance is such that I feel justified in bringing it again to your notice in this connection. This tree is a native of North America, belongs to the same natural order as the magnolias, and is fairly entitled to rank among our stateliest trees. In the eastern, and some of the western, States it frequently attains a height of from 70 to 100 feet or more. Whoever has once seen a well formed tulip tree, with its clean trunk, straight as a column, surmounted by a fine ample head of rich green foliage, will scarcely soon forget it. The leaves are large, rich, and glossy, often measure from four to eight inches across, appearing as if cut off squarely at the extremities, slightly notched, and divided into lobes. The flowers, which are borne singly on the terminal twigs, resemble a large tulip in form, which has given the tree its common name. They are composed of six thick yellow petals, about two inches long, mottled inside with red and green, and have a slight agreeable perfume. As an ornament for the lawn or park the tulip tree is well adapted, its handsome stately contour contrasting finely with the spreading forms of most other deciduous trees; it also has a great advantage in that its leaves are bitter, and hence are seldom eaten by insects. It has been cultivated in Europe for more than two hundred years past, and is highly esteemed. In this species the roots are thick and fleshy, and on this account the tree does not bear transplanting well, unless the roots have been specially prepared by trimming the previous season, or it be moved while young. It is easily raised from seed, which should be sown in the autumn. Occasionally a full grown specimen may be met with in open woods in some of the western portions of Ontario, but it is by no means common. So hardy and beautiful a tree deserves to be much more generally disseminated for planting. Young trees of three or four feet in height should be selected, as they suffer much less from removal than larger trees, and grow rapidly when once established.

The Cucumber Magnolia, *Magnolia acuminata*.—The cucumber magnolia, so called from the appearance of the green fruit, which resembles a small cucumber, is a near relative of the tulip tree, but, although hardy with us, does not occur native so far north, its northern limit being the southern shore of Lake Erie. It is common along the range of the Alleghanies, where, in favourable situations, it sometimes attains a height of 70 or 80 feet. It is a very stately tree, upright and regular in form, and almost entirely free from insects The leaves are large, from six to seven inches long and from three to four inches wide; oblong, pointed, and of a bluish-green colour on the upper side. The

flowers, which resemble those of the tulip tree, are from four to six inches in diameter, of a pale, greenish yellow colour, and slightly fragrant. The fruit is about three inches long, changing from green to rose coloured when fully ripe. This handsome tree is also furnished with thick fleshy roots, which makes it difficult to transplant. These roots should be trimmed in by cutting with a sharp spade all around the tree during the summer previous to transplanting, and, while out of the ground, the roots—which are of a spongy texture—must not be exposed to sunshine, nor to cold, drying winds, either of which will greatly injure them. Fine young specimens of this tree may be seen on the grounds of our fellow members, Mr. Jarvis, of Stratford, and Mr. Chas. Arnold, of Paris.

The American deciduous Cypress, *Taxodium distichum.*—This useful and beautiful tree is found native in swamps in Delaware and southern Illinois and southward. The cypress swamps of the southern States, and especially of Florida, are of enormous extent, and there the tree attains its utmost development, attaining a height of from 80 to 120 feet. In the south, on account of its great abundance, its beauty is often disregarded, but in the middle States, where it is only met with in cultivation, as an ornamental tree, its charming character is fully appreciated. South of latitude 43 this tree will attain a good size, and north of that it will succeed in many localities. The foliage of the cypress is of peculiar lightness and elegance, differing from all other trees, with a cheerful, bright green tint. The leaves are narrow, linear, arranged in double rows on slender leafy branchlets, four or five inches long, which are also partially deciduous in autumn. Late in the season the leaves change to a dull red, soon after which they are shed. The deciduous cypress thrives best in a moist, rich soil, and is admirably adapted for grouping with hemlock and firs, its soft, light green foliage beautifully contrasting with the richer, deeper tints of these evergreens ; it is also a beautiful object standing alone.

The Kentucky Coffee Tree, *Gymnocladus Canadensis.*—This tree, when in foliage, is very beautiful, the leaves are large and compound, made up of a great number of bluish green leaflets, forming a handsome head, which is lightened in appearance by the loose, tufted character of each individual leaf. The tree blossoms early in the summer, producing loose spikes of white flowers, succeeded by brown pods containing the seeds imbedded in a pulpy substance. Downing states that it is found native in the western part of the State of New York and as far north as Montreal in Canada ; Loudon also speaks of it as a Canadian tree. I have never met with it native in the west, but in cultivation it proves very hardy. It is seen in its greatest perfection in the fertile bottom lands of Kentucky and Tennessee, where it frequently attains the height of sixty feet. When Kentucky was first settled the hardy pioneers for a time used the seeds of this tree as a substitute for coffee, from which it has derived its common name ; at present no such use is made of it. During the winter this tree has a very singular appearance ; it is quite destitute of small twigs, and its thick, blunt terminal branches have no perceptible buds, its whole appearance indicating a dry and dead thing rather than a living, thrifty tree.

The Ginko tree, *Salisburia adiantifolia.*—This singular and beautiful tree, sometimes known also as the maiden hair tree, has shown itself to be perfecly hardy in our climate. It is a native of Japan, was introduced into Europe about the year 1750, and into America in 1784. The foliage is singularly attractive and of a fern-like character, quite unlike any other known tree. The leaves are wedge shaped, or somewhat triangular, of a pale, yellowish green colour, with parallel veins ; they are thickened at the edges and cut or notched on the margin, and very closely resemble those of our common maiden hair fern, *adiantum pedatum*, but are much larger in size. In the autumn they assume a yellow tint. The fruit is about an inch in length, enclosing a nut, which, when roasted or boiled, is used as an article of food by the Chinese and Japanese. This tree has fruited in the south of France, but I have been unable to find any record of its having fruited in America. It generally forms a neat, regular, open, conical head, grows in time to a large size, and harmonizes well with buildings, near which it should be located, as its peculiar foliage must be closely examined to be fully appreciated.

The Judas tree, *Cercis Canadensis.*—This is a small but very pretty little tree, or perhaps may be more correctly designated a large shrub, growing from ten to fifteen and

sometimes twenty feet high, valuable for ornamental purposes on account of its pretty pink blossoms in early spring, and also for its very neat foliage throughout the season. It is a native of the northern portions of America, being found from New York to Illinois and southward, and is particularly abundant in sheltered valleys along the Hudson and Ohio rivers. Before the leaves have expanded in spring there is produced from the bare limbs little clusters of pink, pea-shaped flowers, often spread over the branches in great profusion, giving the tree a very attractive appearance. Subsequently its beautifully regular, heart-shaped leaves appear, of a pleasing bluish green tint above and light sea green below. It is well worthy of a place in every garden.

The White Fringe, *Chionanthus virginicus*.—This is a large deciduous shrub, which delights in boggy woods, and is found native in such situations from Pennsylvania to North Carolina. It is a fine object for the lawn, where its large, glossy leaves, and drooping clusters of pure white flowers show to advantage. The flowers appear from May to June, are white, with narrow, fringe-like petals in graceful, drooping racemes; the leaves are large, oval, lanceolate, with a glossy, smooth surface.

The variegated Hibiscus, *Hybiscus syriacus var. flore pleno fol. variegatus*.—This is without doubt one of the finest variegated shrubs in cultivation, its foliage, beautifully marked with light yellow, retains its charming character throughout the season. It has proved quite hardy with me, is of good habit of growth, making a neat, compact bush, which will prove an attractive ornament anywhere, in garden or lawn. The flowers are double, of a dull purple colour, and are produced in great abundance but are not particularly handsome.

The large panicle-flowered Hydrangea, *Hydrangea paniculata grandiflora*.—Of all the later introductions from Japan this valuable, hardy, flowering shrub is, perhaps, one of the best. When full grown it attains a height of from eight to ten feet, and during the summer there are produced, from the top of each branch, large, dense, pyramidal clusters of white flowers, from six inches to a foot in length. These remain in full bloom for several weeks, gradually fading to a dull flesh colour. During the whole flowering season it is a very striking object.

Did time permit I should like to refer to Weir's cut-leaved maple, a variety of *Acer dasycarpum*, which is an object of great beauty. The Norway maple, *Acer platanoides*, and *Acer pseudoplatanus*, the European sycamore maple, are both quite hardy in our locality. The cut-leaved weeping birch, *Betula alba var. pendula laciniata*, is a thing of great beauty, but little known. *Catalpa syringifolia* succeeds very well with us; its beautiful clusters of pale, blueish flowers are very ornamental in early summer, while its large, soft foliage renders it an attractive object at all times. The dwarf weeping cherry, *Cerasus pumila pendula*, makes a lovely little round-headed tree, esteemed as a gem by every fortunate possessor. The *Kolreutrea paniculata* with its large panicles of showy yellow flowers in July; the sweet gum tree, *Liquid-amber styraciflua*, with its curious rough bark and pretty, bright red foliage in autumn. The oak-leaved mountain ash, *Sorbus acuparia var. quercifolia*, and the Rosemary willow are all desirable deciduous, hardy trees, and deserve to be referred to at length.

In shrubs the field is almost, if not quite, as large. The *Forsythias*, with their bright, golden, bell-shaped flowers, are tolerably hardy, and usually bloom with me. *Viburnum plicatum* is a lovely thing, so also is *Azalea amœna*, which, although usually cultivated in green-houses, will, I believe, prove quite hardy in gardens in most parts of Ontario. Among many desirable things, the number of which is almost perplexing, I would mention the Carolina allspice, *Calicanthus floridus*: *Aralia japonica* and *Spinosa*; the variegated cornus, *Cornus mascula variegata*; the Missouri silver tree, *Eleagnus argentea*; the Japan corchorus, *Kerria Japonica*; the dwarf white horse-chestnut, *Pavia macrostachya*; the double-flowering plum, *Prunus triloba*; the cut-leaved sumach, *Rhus glabra var. laciniata*, and some of the newer Spireas.

I have thus but touched here and there on this important subject, but have, I trust, said enough to show that a most inviting field is open for all to experiment in.

THE HARDY CATALPA—BIGNONIOIDES—VAR. SPECIOSA.

By Dr. John A. Warder.

This remarkably beautiful flowering tree has recently occupied so important a place in the lists of our sylva, since Mr. E. E. Barney, of Dayton, Ohio, has presented its claims to the people of the United States, that everything connected with it is possessed of interest. Hence no apology is offered for the following observations respecting its behaviour in Illinois, Iowa, and Nebraska.

It may be premised that this variety was first noticed at Dayton, Ohio, on account of its beautiful flowers and the upright habit of the tree, and described with its variety name in 1853. The origin of the tree was then and still continues to be unknown, but since it has been found elsewhere it is considered an original or native form.

In company with a dear friend and a true lover of trees, a little pilgrimage was made in September to certain spots where the catalpa is cultivated. The first point, our Mecca, indeed, was the home and grounds of that very interesting patriarch among western tree planters, and their biographer, Arthur Bryant. Here were catalpas grown from seed he had gathered at New Madrid, in 1839. One of these stands on a lawn near the house, rearing its symmetrical head fifty feet or more, and supported by a noble stem that is three feet in diameter, stump-high. This is a veritable *speciosa*, and has proved perfectly hardy, though the trees of the common variety have again and again been cut off by severe winters in different parts of the vicinity of Princeton, Ill.

The next point of interest was reached by retracing our steps to the Illinois Central, down which we proceeded to the south line of La Salle county. From station New Rutland, we drove six miles westwardly to the residence of John Litchfield, an old settler from southern Indiana, where we found a small grove of trees grown from seed sown twenty-two years ago. Though crowded, neglected, closely tramped by hogs and other stock in a feeding yard, some of these trees had made a good growth and seemed perfectly hardy. The wonder was that they had survived so much hard usage, but there they stand, and furnish seed from which other plantations have been produced. These are manifestly trees of the variety *speciosa*, as are all their progeny seen in the neighbourhood. The original seeds were sent at Mr. Litchfield's request from the trees growing at his old home in Vanderberg Co., Ind., presumably natives there. So here is another group distinct from those of Dayton origin, while that is the source of all the trees distributed by the brothers J. and E. Y. Teas, Indiana nurserymen, who were among the first to cultivate and distribute them from that focus. Mr. Litchfield has a grove at some distance from his house, occupying one and a half acres on a clayey rise in the midst of a forty-acre prairie pasture lot. The trees stand 6x8 feet apart, are fourteen years old, tall and straight, about forty feet high, and perfectly healthy, shewing no injury from frost. The cattle have spent much of their time rubbing and tramping among these trees, and the seats of a camp meeting shew that the place has been occupied by human tenants at times for the shelter afforded by the leafy canopy, but nothing seems to have damaged the plants. Indeed this is a pattern grove, altogether the most perfect of any of the many plantations examined on this extended tour of forest visitation. Smaller groves were seen in the neighbourhood, and we were told of others near by, all grown from seeds produced by Mr. Litchfield's original trees.

Our good friend, Suel Foster, of Muscatine, Ia., disclaims the credit of discovering the hardiness of the *speciosa* variety of which he has one specimen, saying that it was due to the observation of his partner Morris, who told him one spring that there were certainly two kinds in the nursery, as all of one sort were dead, while the other had withstood the rigours of the winter. Many trees were seen in the streets and gardens of Muscatine, all seeming to be the *speciosa* variety, which, under the name of Hardy Catalpa, is said to be considerably cultivated all through that portion of the State—in latitude 42 and perhaps further north.

At Omaha, Neb., several trees of catalpa were found. They appeared to be of both forms, and some of them seemed to have suffered from the winter or other cause. In one dooryard were two trees, one of which was a *speciosa*. Without admitting our recognition,

the owner was questioned in regard to the trees, and though leading questions were avoided it became immediately apparent that the difference had been observed and was fully appreciated by the proprietor. Afterwards, when visiting the groves of J. T. Griffin, near the city, some of which had been planted among the first west of the Missouri river, it was discovered that he had both kinds of catalpa, but that the tender variety had suffered from the cold on the high rolling prairies while the *speciosa* had escaped injury.

At Nebraska City, and at Brownville, fine trees of *speciosa* were seen, and the same variety was reported at Plattsmouth. The farthest point westward at which the catalpa was observed on this tour, was Lincoln, the capital of Nebraska. The trees in the capitol grounds were two young to be diagnosed with certainty, but the impression received upon their inspection was that they were *not* of the *speciosa* variety.

The great merits of the catalpa, the beauty of the flowers of the *speciosa* kind, the tint and surface of the timber for joiner work, the wonderful lasting quality of the lumber, now fully attested, and the rapid growth of the trees, make this species worthy of being extensively planted by those who would clothe the prairies with trees.—*Western Nebraska Horticultural Society.*

THE MOUNTAIN FORESTS AND WATER SUPPLY OF THE CONTINENT.

By Dr. John A. Warder.

The mountains were intended to be perpetually clothed with forest growths, at least to the *timber line*, at a varying elevation depending upon latitude, where aboreal vegetation is restricted by the low temperature that approaches the conditions of perpetual congelation. The traveller, to be of any use to himself or to others, should keep his eyes open, and observe every phenomenon as he passes through the country.

Limited observations, when among the Rocky Mountains a few years since in Colorado, and more recently in a journey on the Medicine-Bow Mountains of Wyoming Territory, have given the writer still firmer convictions of the truth of the first proposition, which had already been accepted, as truly set forth by forest writers of Europe, and read in the open book of nature, as it was unfolded before his eyes in the Alpine regions of that continent. But these journeys among the Cordilleras of our country, exposed as they are and have been to the ruthless and wanton destructiveness of ignorant and thoughtless man, have filled him with serious apprehensions respecting the future water supply of our western rivers.

The destruction of these mountain forests by fire is indeed a most fearful and melancholy subject to contemplate. An inspection of portions of the public domain by one who has studied the subject, and who has either read of or witnessed the disastrous effects of the spoliation of the forests in elevated mountain heights, cannot fail to fill the mind with the most serious apprehensions.

The efforts of the Secretary of the Interior on behalf of the forests are highly appreciated by those who have made a study of the influence of the woods upon the country's water supply. The mountains (up to a certain elevation, close to the limit of perpetual congelation) were designed for the forests, nor should they ever be stripped of their aboreal covering, for, as the Secretary has well said in his annual report of 1877, if the forests in such regions be once destroyed, they will never be restored. The rationale of the action of the forests as receivers, reservoirs, and fountains of waters, is perfectly simple and familiar to all students of forest science, and may be understood by any one of common powers of observation, who may have had his attention directed to the conditions of the earth's surface in a wood that is in a state of nature. The fallen trees and branches, the undergrowth, the mosses and other herbage, among the decaying leaves, the accumulations of years—all these, and the leafy canopy above—break the force of the falling rains, which come quietly to the earth, and are there arrested, and instead of rushing tumultuously down to lower levels, they are absorbed as by a sponge, until, although gradually percolating into the soil, they reach internal cavities or porous strata, from which they are

gradually distilled through perennial springs, that keep up a constant and regular supply for the streams and rivers.

But to return to Wyoming, to scenes so recently visited—while traversing a broad plateau of the range, and passing through a glorious forest primeval, the traveller closely scrutinized the trees. These were chiefly pines, and almost exclusively of our species, (*pinus contorta*)but among them, in the lower and damper spots, the most lovely firs and spruces reared their tall shafts, clothed with a mystic drapery of depending boughs, bearing the silvery green foliage of the *Menzies*, *Douglas*, and *Englemann's* spruces, and of the *Grandis* firs.

While contemplating these noble trees, we suddenly came upon a scene of *appalling desolation*. Upon a tract of many square miles in extent, as far as the eye could reach in every direction, over many thousands of acres, there was not a living tree to be seen. All, all, were standing bare, stark, and stiff in death; their tall dead trunks blackened by fire, except where time had kindly come to their relief and stripped off the bark, leaving the bare poles that stood by the way like shivering ghosts, waiting in purgatory until storms of years should prostrate them to the earth that bore them, when they would at length gradually crumble into mould to renovate the soil, which had been deprived of all vegetable humus by the fierce flames of the conflagration.

The forest is destroyed, the noble trees are dead and gone, too often never in our time to return, to be a kindly covering and a befitting garniture to the sad wastes, and to clothe these mountain sides with verdure. *Continued* and *continuous* desolation is their sad doom.

Practically speaking, this is and must be so. Whence can come the seed germs for the future aforesting of such extensive tracts? Man, the improvident destructive, will not do it. The kindly winds can transport the winged seeds but a short distance from the parent trees. The cunning and provident rodents have a still more limited range within which to carry the seeds they may gather, and with wise instinct store up for their hyemal repasts, from which a few might escape to germinate and form nuclei, producing at length seeds for further distribution in the future.

Ages must be required to restore these forests in the slow course of nature, and, meanwhile, the degrading agencies of every storm will be carrying away the soil, and scarring the mountain sides with frightful gullies and chasms, occupied at times with violent torrents, for there is no longer any herbage, no moss nor bush, nor any debris to cover the surface, and, spongelike, to absorb and retain the precipitated moisture.

Yes, our worthy Secretary was perfectly right in his assertion that in these bared mountains the forests would never be restored, when thus ruthlessly destroyed. In certain situations and over such vast areas, practically speaking, in reference to any period of time that it is worth our while to calculate upon, any time that we or our progeny for many generations need take any account of, this is sadly true.

But, it may be asked, cannot these terribly destructive fires be prevented? Cannot these calamitous results that must inevitably follow be avoided? Yes! yes! they may, and they *must* be prevented, and that at once, lest our fair continent become a desert, unfitted for the many millions it is capable of happily sustaining upon the broad territory of its beautiful bosom.

This is indeed a great question, and one requiring the exercise of a high order of statesmanship. It is truly a difficult question, but the interests at stake are enormous, and are of infinitely greater importance to this NATION than deciding who of all the great army of office-seekers shall be gratified by an appointment to this or that petty office under the Government; and yet there are those who were sent to guard the great concerns of the State who cannot spare time from the scramble after offices to listen, to study, nor to advocate matters of such great import as this. Oh, that we could be blessed with a race of *statesmen* something better than politicians, and capable of grasping and of solving such questions as this!

Yes! the interests at stake are truly enormous; they involve the welfare of the country, since they concern the permanence and the very existence of our rivers. If their consideration be neglected will not some future explorer of the vast *Sahara*, that may extend eastward from the base of these mountains, find, amid the shifting sands of

that wide desert, only depressions of the surface to mark the ancient beds of our great rivers and their tributaries in that American Sahara, as Champollion has observed them in the wastes of northern Africa, of which he said: "And so the astonishing truth dawns upon us that this desert may once have been a region of groves and fountains, and the abode of happy millions. Is there any crime against Nature which draws down a more terrible curse than that of stripping mother earth of her sylvan covering? The hand of *man* has produced this desert, and, I verily believe, every other desert upon the face of this earth. Earth was Eden once, and our misery is the punishment of our sins against the world of plants. The burning sun of the desert is the angel with the flaming sword, who stands between us and Paradise."*

But how shall this great work, the preservation of the mountain forests, be accomplished? How shall we preserve these treasure-houses of the snow and rain that they shall steadily distil the streams which are to fill our rivers?

It may be effected by wise legislation after we have enlightened the public upon the subject of an advanced forest science, and educated them up to a proper and just appreciation of the importance and of the especial functions of the forests on these mountain heights, as *condensers of moisture*, as *receivers* and as *reservoirs* of the water supplies of a large portion of the continent.

When so educated, and fully informed upon these important truths, with an enlightened public sentiment, the people will become more careful in the use of this dangerous agent; they will be more watchful of their camp fires, they will compel others to be more careful, and they will stamp out the first beginning of a conflagration.

In addition to this enlightened public sentiment, and complementary to it, legislation will be needed to operate on those who may wickedly or ignorantly transgress. Some of the excellent suggestions of Mr. Schurz were incorporated in the bill of Senator Plumb, of Kansas, last winter (S. 609). They might prove valuable as preventive measures, especially the appointment of forest guards, as proposed in the 3rd section. Section 13 is intended to prevent fires on the public domain, whether in prairie or timber. Such a provision has never existed in the case of Government lands, though provided for by some of the states.

The losses by fires are enormous, and should be prevented.

Some of us know by sad and painful experience how difficult it is for the philanthropist, who presents a simple proposition for the public good, however great its importance, to arrest the attention of the public. We have also learned how almost impossible it is to reach the ear of the law-making powers, and to excite in their minds an active interest in such questions as are here presented; in a word, how herculean an undertaking is presented, when we attempt to educate the people, and those who represent them in the Halls of Congress, up to a proper and full appreciation of such a subject as this of *Forestry*, which so deeply concerns the public weal.

More especially unpromising does such an effort appear, when an attempt is made to impress upon their minds the absolute necessity of keeping these extensive ranges of mountain heights in a condition best adapted to attract and condense the atmospheric moisture, to receive the precipitation, to retain it for a time, and then gradually and quietly to give it off through perennial springs, as limpid fluid, to supply the fertilizing streams that shall fill the rivers which are so happily and extensively distributed over our great continent.

You who are engaged in forest studies, you who are engaged in planting trees, will unite in presenting our thanks to Secretary Schurz for the noble stand he has taken in defence of the forests on the public domain, and for the part he has taken to call public attention to the vast and wide-spreading influence exerted by them on the present and future welfare of the country. Long may he be permitted to prosecute these noble efforts in behalf of the protection, preservation, and extension of our woodland heritage!

Mr. President, the above paper is but a repetition of an open letter addressed to the Secretary of the Interior, which may never have fallen under the notice of any of your

* Quoted by Dr. Oswald, and from him by Eli K. Price, in "Sylviculture," an essay read before the American Philosophical Society, Philadelphia, 1877.

members. No apology will be offered, however, for presenting it to men like yourselves, even thus at second-hand, because you are known to be interested, as western tree-planters ever are and should be, in everything that relates to this great question of trees. Situated as you are, on the great open plains, this is to you especially a vital question, and this aspect of the infinite value to you of the mountain forests cannot be devoid of interest, even in the imperfect manner of its presentation by such a tyro in forest science as your friend W.—*Western Nebraska Horticultural Society.*

POPLARS, ABELES OR ASPENS, AND COTTONWOODS.

By Dr. John A. Warder, of Ohio, President of the American Forestry Association.

In the *Gardener's Monthly* for November, 1877, are some strictures upon the name *Populus angulata*, used by my friend, Dr. Furnas, of Danville, Indiana, as applied to the Carolina Poplar. His stock was received from Mr. Parry, New Jersey, and through him it came under my notice in some cuttings received last spring, which have made a growth of three to four feet. For the suggestion of the name *angulata*, as applied to these plants, I must assume the responsibility, and it may be an error. The conclusion may have been reached too hastily. It was given on the authority of Michaux' Sylva Americana.

Having been induced to look up the authorities within reach, the following analysis of the genus, the result of this investigation, is presented for the benefit of the members.

Cottonwoods.

1st. *Populus angulata*—Michaux' Carolina Poplar. Michaux says this species, which he met under the name of Carolinian Poplar, was found southward, in Virginia, and on the Mississippi and Missouri Rivers growing with the cottonwood *Canadensis*. He describes it as tall-growing and upright, which is the character of the Carolina. The buds are short, dark green, and destitute of the resin found on those of the cottonwood and other poplars. This is believed to be the tree so prevalent in parts of Belgium, where it is planted along the canals, for which purpose it is especially adapted by its upright habit.

2nd. *Populus Canadensis*, of Michaux. The cottonwood is considered by Dr. Gray* to be the *monilifera* of Aiton, and the *lævigata* of Willdenow. Wood's No. 5 *monilifera* of Aiton, seems to be different, with habitat "on the Hudson near Troy, N.Y., apparently native." "Fide Beck."†

Michaux found this species as far northward as forty-three degrees. It is abundant in the Black Swamp, in North-western Ohio, and fine trees may be seen on the banks of the river below Detroit, Mich. Michaux describes the tree as larger than the *angulata*, and the bark as thicker and more deeply furrowed, having a wider head and with the boughs more thickly branched. This character of the outer bark has attracted the attention of the fishermen on the lakes, who utilize it as a substitute for the more costly bark *Quercus suber*, or cork. Sections of this substance, often three inches thick, are turned into oval form and perforated, so as to be used as floats to their gill-nets.

Michaux reports this species rare on the Atlantic slope, but very common on the Mississippi above the Arkansas. At the mouth of the last named river it grows abundantly around the town of Napoleon. It is the chief source of the steamboat fuel on our southern streams.

3rd. The Virginian or Swiss Poplar, *P. monilifera* of Michaux, supposed by Gray to be *P. monilifera* of Aiton, does not appear to have been found in this country by the Michaux, father or son, but they say it is extensively cultivated in Europe, especially in Switzerland. In France the males only are found. The young shoots are angular. Comparing it with cottonwood, Mr. Fancourt, director of forests and water-courses, says

* Manual of Botany, Asa Gray, 2nd Edition, 1856, His. No. 4, page 419.
† Class Book, Alphonso Wood, 41st Edition, 1855, page 507.

the leaves are smaller and less distinctly heart-shaped; the young shoots and twigs are smaller and less angular, becoming cylindrical in the third year, and the limbs are less divergent than the cottonwood. It also grows faster, and succeeds in drier soils, hence its popularity in France.* The wood is said to be softer than cottonwood, or *P. Canadensis*, of Michaux. Dr. Torrey found it in Western New York, on Lake Oneida and Genesee River.†

4th. The Cotton Tree, *Populus argentea*, Michaux, and according to Gray, *P. heterophylla*, L., is found in the Middle, Western, and Southern States; and Michaux, especially, refers to a large swamp in southern Illinois, and to Fort Massac, on the Ohio River, as habitats.

The tree is large, with thick bark, the shoots are round, the young leaves very downy, becoming large, and having the lobes at the base overlapping each other.

The wood is described as inferior, becoming yellowish at the heart.

All of these would probably receive the name of cottonwood among our western wood-choppers; and, indeed, they bear very near resemblance, and have close analogies. The fine botanical descriptions have been purposely omitted in this resume.

Poplars.

Populus balsamifera—Tacamahaca, or Balsam Poplar, is a very distinct species. This is particularly northern, extending to Stone Lake, latitude sixty-three.‡ Leaves on round petioles, dark green above, rusty brown beneath; tree of medium to large size, with open, straggling branches. Though unseemly, it is often found in cultivation.

Populus candicans, of Aiton, Balm of Gilead, is a variety called also Heart-leaved Balsam Poplar. This form is chiefly seen in cultivation, though it has little to recommend it.

Populus angustifolia, of James, is described by S. B. Watson, of Clarence King's survey of the fortieth parallel, as a common tree in the Rocky Mountains. It is now grouped with *candicans* and *balsamifera*, of which it is a very distinct western form, having also quite a diversity in its foliage, some leaves being ovate, while in other trees they are nearly linear, and with a drooping spray. The resemblance to willows is very striking, as seen on the Platte River, Colorado, near Denver.

8th. *Populus trichocarpa*, Torrey, is western, found in Truckee Valley.

9th. *Populus Nigra*, L., European, was not recognized by the Michaux in this country, but trees found near Albany, N. Y., on the Hudson, and in New York City, were described by them as *P. Hudsonica*, and by Pursh as the *betulifolia*. There is little doubt about its having been introduced from Europe, where it grows to a large size, and with *P. alba* is much used along the Danube in reclaiming low overflowed lands, whose thickets arrest the drift of floods and furnish abundant material for the fascines used in the wing dams and levees, erected for improving navigation.

10th. The Lombardy Poplar, *Populus dilatata*, of Aiton, is no longer looked upon as a species, but merely a variety or sport from the *nigra*. This is extensively grown as an alley tree along the highways of southern Europe, where it is a great favourite, despite its extremely formal habit. It was early introduced and extensively planted in this country also, particularly in the streets of towns and cities. In the Eastern States very large trees may yet be seen in good condition. In the Western States, especially in northern Illinois and Wisconsin, it has been largely planted to fence-rows as wind-breaks, and the effect in a prairie country is very pleasant; but in our western soils the tree does not prove to be long-lived. The plants found in this country appear to be only males. How is it in Europe?§

* N. Amer. Sylva. vol. ii., page 120.

† New York Natural History, Botany, vol. ii. page 215.

‡ Dr. Torrey, Natural History, N. Y., Botany, vol. ii. page 316.

§ This question is already answered by my friend and jury colleague at Vienna, Gav. Giovanni Carlo Siemoni, who says this poplar is but a form of the *P. nigra*, and that all the plants are males. He adds that it has long been extensively planted in Lombardy, particularly along the River Po. In evidence of its antiquity, he quotes Ovid's reference to it.—*Manuale d'Arte Forestale*, Firenze, 1872, page 137.

Watson, in his "Annals of Philadelphia," says this tree was introduced into that city in 1774, by William Hamilton, Esq., of "The Woodlands" (near the Centennial Exhibition), and all the Lombardy Poplars in the United States may be considered branches, elongations or offsets of the tree from which Mr. Hamilton obtained his specimen.*

Aspens.

Aspens, or Abeles form a distinct group among the poplars. They are usually smaller trees, especially the American species.

11th. *Populus tremuloides*, Michaux. Quaking aspen is here but a small tree of the second or third class, seldom more than twenty to forty feet high, particularly toward the north, where it becomes a mere shrub. A form of this species in the parks of the Rocky Mountains, springs up spontaneously in the greatest abundance wherever the woodlands have been burned over. The older trees had handsome shafts fifty to sixty feet high, and are used in construction. This is almost unique as a deciduous tree among the conifers of that region.

Generally speaking, this species has little value, but there are some peculiar forms which are cultivated and placed for effect in gardens and parks.

12th. *Populus grandidentata*, Michaux, Michigan Poplar of nurserymen, is a much finer tree, also northern in habitat. On account of its rapid growth, this had received considerable attention by western planters, and though only a poplar, merit is claimed for it as fencing material ;† the poles cut in early summer and peeled have been found to last as well as rails nailed to posts for fencing.

13th. *Populus canescens* or the *Populus alba*, Linnæus, the common white or gray poplar, with its many forms or varieties of Abeles, Athenian, maple-leaved and silver poplar.

Though widely diffused and planted everywhere, and multiplied wonderfully by numerous suckers in their new home, these are believed to be of European origin. If correctly understood, my good friend, Prof. Karl Koch, of Berlin, who has made a life study of trees, considers this species to be American, or common to both hemispheres. His valuable work‡ is unfortunately not at hand.

Populus tremula, Linn., is a small tree in Europe which may some day be united with our *P. tremuloides*. It is chiefly valued as a first crop on devastated tracts to prepare the soil for those of greater utility, says Siemone.§

In Southern Europe the white poplar becomes a noble tree, and the timber is much used in the construction of dwellings. It may be found valuable by our western planters. Michaux claims two distinct trees, the white and the gray, attributing superiority to the latter.—*Western Nebraska Horticultural Society.*

THE TIMBER QUESTION.

This is a matter which has no politics in it, but which has already become an important question. In the new north-west part of the State, the people are yet labouring to get rid of the forest, but in the old and early settled portions it is evident to everyone that the war of the axe and the trees has been carried too far.

It is certainly one of the functions and one of the duties of the Legislature to consider this matter. It is an agricultural question also: and why that Board and the College has not given attention to it, is something of a mystery to us.

The first we heard of it, as a practical effort, came from the State Horticultural Society, in the form of a petition for a law encouraging the culture and preservation of forest trees. This was referred to the Committee on Agriculture in the House. Next came a memorial

* Darlington's Agr. Botany, 2nd Edition, page 332.
† Bryant's Forest Trees, page 124.
‡ Koch's *Dendrologie.*
§ *Manuale d'Arte Forestale.*

from Colonel Whittlesey, a member of a Committee of the American Association for the Advancement of Science, presented by Mr. Chapman, which had the same reference as that of the Horticultural Society. The Committee of the American Association have presented the whole subject to Congress and the Executive, so far as it has connection with the public lands. President Grant has sent in a message to Congress, and that body is effectually at work offering land bounties for tree planting on the prairies.

The future consequences of the destruction of timber will be appalling if they shall be the same here as in other countries—with our rapid modes of doing everything, this future may not be very distant. It is the object of the Scientific Committee to collect the facts respecting timber destruction as they have developed in Europe.

The papers before our Legislature refer less to the general subject than to what pertains to Ohio, for it is not in the power of Congress to do much for us. This we must do ourselves.

Mr. Chapman reported a bill which has not yet been discussed, which embraces only the encouragement of trees in the public highways. Something more than this must be done eventually; but this is a good beginning. The subject will work its way into notice from the necessity of the case, though its progress may be slow. Some two years since we cuddled the forest trees somewhat, as may be seen by our files, but with very little effect.

People are slow to perceive the advantage of what seems to concern posterity. To show that the growth of trees does not inure to future generations entirely, we quote largely from the memorial of Col. Whittlesey, which was printed by the House. He says:

The benefits of tree planting may be felt in fifteen or twenty years, and timber cut in thirty to thirty-five years.

In Salisbury, Connecticut, on the rocky slopes of the Taconic mountain, too rough for cultivation or even pasture, the spontaneous growth is cut once in twenty-five years for making charcoal, and pays the interest on $100 per acre. It is divided into twenty-five belts or strips, running from the base to the summit of the mountain, one of which is cut away each year. I have seen in southern Illinois, in 1832, a small growth of oak and hickory, on the borders of the prairie, which in 1848, after a lapse of sixteen years, was large enough for many uses on the farm, making two posts or two rails.

In Aurora, Portage county, there is a farm where the shell-bark hickory has been allowed to grow in an old slashing. After twenty years these trees produced a profitable crop of first-class nuts; and the larger ones were cut for axe helves and pick handles. Old settlers of Stark county, Ohio, have told me that where, in the year 1800, there were openings covered with bushes not as high as a man's head, in 1850 the trees were few of them less than fifty feet in height. In Massachusetts a white pine, which had been transplanted, attained a diameter of two feet (at two feet above the ground) and a height of eighty feet, in thirty-five years.

The City of Cleveland has acquired the title of the "Forest City," on account of shade trees planted in the streets and public grounds, most of them within twenty-five years. This was brought about by public opinion, cultivated by the example of the late Leonard Case and a few other large owners of city lots. An elm set out by him in 1824 still thrives near the south-west corner of the post office. Its girth two feet above the pavement, is seven feet, and consequently its diameter is two feet five inches. In 1836, the Hon. John W. Allen, John M. Sterling, and the late Charles M. Giddings planted native trees in front of lots in which they were interested. By their exertions, the village corporation authorized the same to be done in the north-east quarter of the public square, and in 1839-'40, in other parts of it, under the direction of John Wills. Those trees are principally elms, and now, after a life of thirty-five to forty years, are from one and a half to two feet in diameter. By observations upon nineteen cultivated trees, whose age was known, I find that the average increase in diameter is about two-thirds of an inch each year; the annual layer or ring of growth being not far from one-third of an inch.

For light lumber and wooden ware, the whitewood or poplar, the white pine, chestnut, and the linden or basswood may be used in thirty years from the seed. Three to five years may be gained by transplanting young trees. In a field of seedlings the less thrifty

can be profitably thinned out and used as fuel, at twelve or fifteen years; and the ground will then produce pasturage. If at the expiration of thirty or thirty-five years it shall be entirely cleared, the soil will be found restored and ready for cultivation.

Every farm of one hundred acres should have at least fifteen acres in growing woodland, in which, by proper care, the crop may always be kept good.

As the primitive forest is thinned out for timber, or by natural decay, by a proper and well advised attention to the second growth it will renew itself perpetually.

In this State, besides the ordinary uses for timber on farms, there is an extraordinary demand for fuel and ties, by railroad companies. Their fuel may be obtained from coal mines, but no substitute is known for wooden ties. The roads of the State now require for repairs, without regarding the laying of new lines, about a million and a half of ties annually.

What is necessary here is the preservation of a proper proportion of wooded land, which is not only valuable property, but is indispensable to the full enjoyment of the remainder. When the growth of native timber is wholly destroyed in the ancient States of Europe and Asia, the region becomes, in process of time, a desert, or so near it to be of little value. The reasons why growing trees have such an important influence upon the increase of inundations, and consequently of low water and of drought, the diminution of atmospheric moisture, which affects vegetation of all kinds, the increase of heat in summer, and of cold in winter, rural beauty, shade, health, and numerous consequences that come on slowly, but in time produce prodigious results, I do not at this time propose to give.

J. A. W.

SUMMER MEETING.

The summer meeting was held at Guelph, on Tuesday and Wednesday, July 6th and 7th, 1880.

The President and Vice-President being absent, the Secretary called the meeting to order.

P. E. Bucke, Esq., of Ottawa, was called to the Chair; the minutes read; and the question "Which varieties of Strawberries are least injured by late frosts?" considered.

In reply to this inquiry it was stated that as a matter of course the later any variety came into bloom the more likely it would be to escape the spring frosts, but that usually the late blooming varieties were also late in ripening. Also that those varieties which had an ample supply of foliage reaching above the fruit stalks were less liable to suffer, because the leaves, in some measure at least, protected the blossoms.

Mr. Gilchrist remarked that they were very liable to have late frosts at Guelph, and that he had not observed any marked difference in varieties with regard to their ability to resist frost, or to the blossoms escaping the effect of the frost by reason of being protected by the leaves, but that if the variety happened to be in full bloom at the time the frost came, the fruit was mostly destroyed; yet if it had blossomed long enough before to admit of the berries having attained to that stage of their growth when they are turned down towards the ground, the fruit mostly escaped injury, as also did those varieties which were not yet in bloom. Notwithstanding the fact that the Wilson blossoms are not protected by the foliage, it was the variety that strawberry growers relied upon in that locality for profit.

Further conversation on the subject failed to bring out anything definite with regard to the varieties of strawberry which suffered least from spring frosts, and the meeting adjourned, to meet at the Experimental Farm in the afternoon, and at the City Hall in the evening.

The President and Professors received the Association with great cordiality, and did all in their power to make their visit agreeable and instructive. After giving the gentlemen a bird's-eye view of the farm from the top of the main building, they conducted them over that part of the farm which is devoted to fruit and garden culture, and explained the nature of the planting already done, and what has been commenced this spring of fruit

and forest tree planting for educational and experimental purposes. A field of twenty acres has been set apart for fruit culture, with the expectation that ultimately it will be occupied by trees of apple, pear, plum and cherry, and in the meanwhile afford ample room for the cultivation of small fruits, other than grapes, for which a field of some five acres will be set apart. These fruits are intended to afford the institution a continuous supply of fresh fruit for consumption, and the means of examination, comparison and experiment as a part of the instruction given to the pupils.

A commencement has also been made in forest tree planting, beginning with the sowing of tree seeds, and the gathering of young trees from our own forests and planting them in rough land that has never known plough, with a view of illustrating what can be done by every farmer in the way of supplying himself with trees for ornament, shelter and economical purposes.

The members were also shown the fine specimens of some of the most valuable breeds of cattle and sheep, which have been imported for the farm, thus enjoying an opportunity, of examining and comparing different breeds, not often to be found. In this way the afternoon was passed both very agreeably and profitably, and the members returned to the town in time for the evening meeting, most favourably impressed with the educational advantages of the institution, and the courteous hospitality of the officers.

It is gratifying to learn that the farmers are taking an interest in this School of Agriculture, and that already several thousands have visited the grounds this summer as a pleasant holiday excursion for their families, and have shown their appreciation of what is being done there for their benefit by paying a visit to the institution; and, although sometimes coming in considerable numbers at a time, not a shrub, or plant, or flower, or fruit was touched.

Evening Session.

After appointing Messrs. Leslie, Beall, and A. M. Smith a Committee to examine the fruits on exhibition, the meeting listened to a paper from Mr. B. Gott, Arkona, upon the fruit prospects of the County of Lambton.

Mr. Gott received the thanks of the meeting for his interesting paper, which he was requested to hand to the Secretary for the Annual Report.

REPORT OF THE FRUIT PROSPECTS OF THIS SEASON.

Gentlemen of the Fruit Growers' Association of Ontario:

The present season being every way a peculiar one, I concluded that in coming among you, a statement or report of the fruit prospects of that part of Ontario with which I am familiar, might not be uninteresting. This county, viz., the County of Lambton, in the extreme west of Ontario, is rapidly becoming widely and favourably known as a successful and promising fruit-growing region. In the same County of Lambton we have the famous grape, peach and strawberry section, extending for several miles around Arkona, on the banks of the river Aux Sauble; the noted apple and peach orchard section for many miles on the lake shore in the Township of Bosanquet, and a most admirable general fruit section around the Town of Sarnia, and extending the whole distance on the borders of the beautiful River St. Clair on the frontier. The county is also known and favourable in all its divisions for extensive home fruit productions, so that its people have an abundance of the good things of this life as well as the hope of that which is to come. The capabilities of this extensive and wealthy county for extensive fruit production, are still very largely untried, and a rich reward in this direction awaits the industrious, intelligent and patient fruit grower. For many years past we have had in this region a large share and plenty of rich and beautiful fruit annually; for, although in some years our fruit has been less plentiful than in others, yet by carefulness and economy in saving and use, we have always had plenty, and an entire dearth in this valuable product of our soil of late years has been entirely unknown to us. This year, however, we have not merely

had plenty, but we have a superabundance of fruit in prospect as though we were about to be surfeited. Our whole country is teeming with its riches and bountiful products both of the fruits of the field and of the orchard. So abundant are the prospects of the general fruit crop that growers are already beginning to ask in deep concernment, where shall we market our crop? What shall we do with our fruit? and such like, and prices are dubious. Our earliest and most welcome fruit crop of strawberries is already gathered and taken care of, and a most plentiful and beautiful crop it was. One local grower has reported in our paper his product from one half acre to have been 1,568 quarts, sold at an average price per quart of 9 cents, or $283 per acre. The fruit has been exceedingly fine and very plentiful, so that all have had a large supply; and with the exception of rather heavy rains at the commencement of its ripening, nothing occurred to mar its beautiful appearance and excellent quality. This fruit is attracting much attention in this part of our county and is very likely to be very largely grown.

The raspberries, currants and gooseberries are just now on the point of ripening, and are coming in in great abundance, and of the most admirable quality ever known. The crop of both black and red raspberries is fast becoming very acceptable in this section, and is likely to prove remunerative to the growers of so rich and delicate a fruit. One gentleman in this neighbourhood is already planting very largely of them and has them in great variety and perfection, and many others are following in his wake. Gooseberries and currants are of the most excellent quality, and so plentiful generally that they are unsaleable. Our people are very much in need of simple methods of artificial means of preserving these and other summer fruits. When they are plentiful they are a drug on our hands, and at other times we are in great need and would be glad of them. The great variety and excellence of these fruits should secure for them better attention and better culture, and we are pleased to see considerable improvement in this direction, and the finest of fruit is now abundantly produced.

Our crop of apples this season will be plentiful but not abundant. Many of our apple trees are biennial in their bearings, and on account of a very heavy general apple crop last season this is the off year with many trees. Nevertheless, in summer fruits especially, the crop will be considerable, and plentiful in Early Harvest and Red Astrachans the most popular and profitable of summer apples. In some cases also winter varieties of standard merit will be adequate to the demands for home and family use; and we shall doubtless be able to show this fall at our local and popular exhibitions some of the finest and handsomest apples seen for many years. Contrary to all expectations the ravenous insects and diseases of all our fruit bearing trees and shrubs are most remarkably favourable; and not for many years have we enjoyed such a freedom from insect pests as in this. In this particular our apple trees are no exception as far as the tree and the leaf are concerned, but we already notice some considerable mark of the destructive codlin moth in the fruit. If better attention were given to the suppression of the ravages of insects and diseases on our fruit trees our rewards would doubtless be great.

Pears are not so much planted among us and do not receive so much attention as they richly deserve; but where they are planted, and receive an ordinary amount of intelligent carefulness, they richly reward the labours of the patient fruit-grower. The crop this season will not be large, but some very fine fruit will be produced, especially of Bartlett and Flemish Beauty, the two most popular and profitable of all pears. It is very remarkable that scarcely any of the *dreaded blight* on pear trees has been known in this county, and they are also most remarkably free from the depredations of insects. This may be therefore looked upon as the *El Dorado* of the pear tree and the very home of this valuable and luscious fruit.

The *Cherry* crop is not abundant and save only in one variety, this county is not celebrated for its beautiful cherries. This variety usually called the *common sour cherry*, is plentiful enough and fully adequate to supply all the inhabitants with acid during the rest of their lives. This common sour cherry, or Late Richmond of the catalogues, is almost indigenous to this county, and easily and abundantly propagated, and as Col. Brooks remarks soon makes a free nursery to the neighbourhood. Some large trees, however, of improved varieties are very productive, and annually produce very fine fruit, but spring frosts are their greatest bane. There is a singular fatality this season come over some of

our fine young growing cherry trees. It appears to be a winter or frozen sap blight, caused evidently by our unusually mild and spring-like winter. The theory is that the warmth attracts the sap into the body of the tree, and afterwards freezing, then bursts the wood-cells, and the tree, though making an attempt to start and live, soon dies. We shall lose some fine trees from this cause. The cherry slug is not present.

Of *Plums* this may be regarded as the favourable home, and the crop will be amazing both for quantity and quality. Black knot is very prevalent, and little is being done to prevent its destructive spread. It is difficult to see what our municipal officers are doing in this matter. The dreaded and destructive little Turk alias the plum curculio, is very abundant and persistent, but continued and patient jarring overcomes the difficulty, and the crop is saved.

This is the centre of a very interesting peach section, and the crop of this popular and valuable fruit promises to be the largest known in this county for many years. Several causes are operating on them to thin them out, yet the trees are literally loaded to breaking down, and it will be impossible to obtain a market for the fruit in local centres. But as the fruit is usually produced so fine and of such excellent quality it can be very profitably and easily shipped to other markets where good paying prices can be obtained. The dreaded *Yellows* of which we hear so much in peach sections is not known among us. This we consider a happy exemption, and we are anxious to make the best possible use of it.

Thus to sum up the remarkable points or characters of this very remarkable season, we have first, a season of extreme and unusual earliness. Every kind of fruit appears to be fully two weeks in advance, by the day of the month, of its usual time of ripening. Secondly, a most abundant crop of all kinds of fruit simply, excepting apples and pears, and of these we shall have a plentiful supply; and, thirdly, the season has been most remarkable for its comparative immunity from insect ravages and blight. This is a great blessing, for which we should be very thankful, as also I trust we are. Hoping for like favourable circumstances in all parts of our fruitful country,

I am yours very truly,

B. Gott.

Arkona, Ont., July 5th, 1880.

Raspberries.

The question "What raspberries succeed best in the vicinity of Guelph?" was considered.

Mr. Gilchrist remarked that the Philadelphia succeeds best, some other newer varieties are tender; that he does not think raspberries can be grown here with profit, for the reason that wild raspberries are so abundant and cheap. The Clarke and Arnold's Diadem are tender.

Mr. Bueke, of Ottawa, has found the Saunders raspberry very hardy, he has raised some seedling raspberries from the seeds of Saunders' hybrid, and they proved to be some of them white, some black, and some red.

Mr. Elliot, Guelph, does not believe that raspberries can be profitably grown at Guelph. He finds it necessary to lay all varieties down to protect them from the winter. The Clarke is the strongest and best grower he has yet tested, and he believes it to be as hardy as any variety. He has grown Franconia, Herstine, Brinckle's Orange, and Marvel of Four Seasons.

Mr. Davidson had tried to grow raspberries, but had failed.

Mr. McCrae grows Clarke, it has stood the past winter very well.

Gooseberries.

The subject of gooseberries was then taken up.

Mr. Elliot had grown only Downing and a small red variety.

Mr. Murton has grown the large gooseberries with much success. The soil is a deep rich loam, stiff, and the plants are well trimmed up by cutting out the lower branches; is able to grow Whitesmith and other English varieties without mildew.

Mr. Patterson has grown large English sorts for some ten or twelve years. He usually has more or less mildew, but by thorough pruning and thinning out of the branches, is able to prevent it from spreading to any serious extent. He finds them to grow equally well in sandy, loamy, and stiffer soils.

Mr. Gilchrist has found all of these varieties to mildew badly with him, and believes that we must look to our own native varieties for good gooseberries, in the future. The Whitesmith has been winter-killed in his grounds.

Mr. Davidson has found the English varieties to mildew, and believes it is attributable to the fact that the plants are too much shaded.

Forestry.

"What are the economical uses of woods other than pine, and what are their respective commercial values?"

In reply to this question, Mr. Thomas Beall, of Lindsay, submitted the following memoranda:—

Ash, Black—Is used for hoop timber, fruit baskets, common carriage work, such as sills, boxes, etc., and also in cabinet work and house joining. Value, from $8 to $10 per M.

Ash, White—Is used for handles for nearly all kinds of agricultural implements, such as spades, shovels, picks, forks, hoes, and for scythe-snathes and cradles, for barley-forks, hay-rakes, etc.; also for waggon tongues and boxes, crossbars, whiffle-trees and neck-yokes. A small quantity is used by cabinet-makers, and it is of late years being much used for inside finishings for house-building, for window and door casings, wainscoting, flooring, etc. Value, from $15 to $20 per M.

Beech.—For Firewood only.

Butternut.—Used in cabinet-ware for common sideboards, table tops, whatnots, bureaus, etc. Value, from $10 to $14 per M.

Basswood.—For common chair work and seats of various kinds, buggy and cutter work, fanning mills, canoe building, and also used by cabinet-makers for many articles of household furniture. Value from $8 to $12 per M.

Birch—Is much used (in connection with maple) for flooring in public buildings, halls, etc., also in stair building for newel posts, ballusters, rails, etc., and is also much used by cabinet-makers. Value from $15 to $20 per M.

Cherry.—Very scarce. Uses same as last-mentioned. Value from $20 to $25 per M.

Cedar.—Nearly all our rail fences are of cedar, also our fencing posts and telegraph poles. It is much used also for railroad ties, and for sleepers for side-walks, cellar floors; also for shingles. Cedar lumber varies in price more than any other of our native woods, ranging from $6 to $20 per M., the larger price being readily obtained for long, wide, and clear boards.

Elm, Rock and Gray.—Used much in the manufacture of heavy sleighs and cutters, wooden ploughs, etc. Value $12 per M.

Hemlock.—The bark used for tanning leather. The wood makes excellent joists, scantling and rough boarding, or any rough work into which nails are driven, such as sleepers for sidewalks, and also for railroad ties. The lumber sells at from $6 to $8 per M.

Maple.—Used largely in cabinet-making, and for flooring (with birch or walnut). It is also in great demand for the manufacture of the wood-work of nearly all kinds of agricultural machinery, or other articles where wood is required having great rigidity. Value about $16 per M.

Spruce.—Is sometimes used for flooring, and is much used for planking for steamboats, scows, etc. Value about $14 per M.

Tamarack.—Is much used for ladders, scaffold-poles, ledgers, pultogs, etc., during the construction of buildings. It is often used for rafters for barns, sheds, etc. It is very useful wherever long, straight, and tough poles are required. It makes excellent railroad ties when sufficiently large. A small quantity finds its way to the saw-mills where it is made into flooring, and is worth about $12 per M. Great numbers of the stumps are used as knees in boat and scow building.

Oak, White—Is very much used in the manufacture of heavy waggons and carriages of all kinds, sleighs and cutters, and also for many of the agricultural implements and machines at present in use, and it is also used for some of the finer qualities of cabinet-ware. Value from $20 to $25 per M.

Oak, Blue—Is used for the same purposes as the foregoing, excepting cabinet-work. It is a better quality of timber than the white oak, and is very scarce. Value, $25 to $30 per M.

Oak, Red.—Used largely in the manufacture of household furniture, and for stair building, newel posts, ballusters, hand-rails, etc. Value $15 per M.

The foregoing statements respecting the economic uses of woods, are confined to the kinds found growing in the vicinity of Lindsay, and the uses to which they are applied, are those prevailing in this part of the country. The prices attached are the market prices in this town.

THOS. BEALL.

Lindsay, 6th July, 1880.

The meeting thanked Mr. Beall for the very valuable information he had given, and the remainder of the evening was spent in conversation upon the uses to which our various woods were put, and the constantly increasing cost of many of them, owing to the diminishing of the supply and the increasing demands of an increasing population.

Morning Session.—July 7th.

At the opening of this session the Secretary read a letter he had recently received from one of our most prominent pomologists, Mr. James Dougall, Windsor, accompanied with a photograph of a new weeping cherry that had originated on Mr. Dougall's grounds, and a branch laden with fruit taken from one of his new seedling cherries, named by him the Windsor. In this letter, Mr. Dougall states that the Windsor is a very prolific and valuable market fruit, the specimen branch sent being from a young tree that is bearing for the second time, and is literally loaded with fruit, all the branches being fully as well and some much better loaded than the branch sent.

The Secretary stated that he only regretted the branch had not been received a little later, so that he could have brought it to this meeting, for it was certainly the most profusely covered with fruit that he ever saw. The cherries, though not *very* large, were of fine size, and seemed to be quite firm fleshed. They were hardly ripe enough to enable him to judge of the flavour. He should think that if any variety of cherry would be profitable as a market sort this certainly would take the lead.

He also exhibited to the members the photograph of the Weeping Napoleon which he had received from Mr. Dougall, which was taken last year, and remarked that the fruit sent him from this tree had become mouldy in the transportation, and that he could not speak of its quality. The fruit did not seem to be as large as that of the Windsor, and was darker in colour.

Mr. Dougall states in his letter that the origin of the weeping variety was a side shoot from the stem of a Napoleon cherry, that grew out below the graft and bent down to the ground. Some trees were budded from the shoot, one of which, being worked up high, grew to be quite a large tree, the others being budded at the ground never could be got to grow into trees. The one from which the photograph was taken was budded subsequently at nearly six feet high, and shows a most perfect and beautiful weeping habit.

The Secretary also read a letter from Mr. A. Hood, Barrie, in which he regrets his inability to send to the meeting some fruit of a cherry tree grown in the grounds of Mr. J. R. Cotter, of Barrie, which he describes as being a forest growth, though the fruit bears no resemblance to the com non wild cherry, and as being perfectly hardy in that climate and productive. He thinks the tree worthy of attention, because the fruit is superior to anything else that is equally hardy, healthy and vigorous.

Mr. Hood states that he thinks fruit will be a failure in his section—plenty of blossoms, but little fruit. Plums in particular, from some cause or other have set very little fruit, and the curculio has put in his mark on what little there is.

The meeting expressed their thanks to Messrs. Dougall and Hood for their kindness in bringing these matters to their attention, and referred the letters to the Secretary for incorporation in the report.

The Chairman, Mr. Bucke, of Ottawa, opened the discussion upon "The advantages of tree growth and shelter on climate, rainfall, and the protection of growing crops," with an interesting paper, for which he received the thanks of the meeting, and which is as follows :—

FORESTRY AND TREE-PLANTING.

By P. E. Bucke, Ottawa.

At the Summer Meeting of the Fruit Growers' Association of Ontario, held in the City of Guelph, the subject of Forestry and Forest Trees for beautifying cities and farms, and for profit, was discussed in open meeting for the first time in Canada.

The subject is an interesting one and must soon awaken considerable attention amongst the rural classes, and the manufacturers of the different varieties of woods. In all the countries of the old world the subject of Forestry is recognized as one of the highest importance, and is usually made a matter of Government attention. In some countries where the native forests have been wholly removed there has been a great waste of the ancient fertility of the soil, and often an exhaustion, if not an absolute destruction of the nations that once flourished in affluence.

Palestine, Arabia, and various parts of Asia Minor and Turkey in Europe, are illustrations of this waste and ruin in the east, while Spain is perhaps the most striking example to be cited in the west. It is an indisputable fact that the powerful nations which have for centuries occupied these countries first rose to wealth and stability owing to the natural wealth of the soil and the forests which originally occupied the surface, and their decline was at least coincident with the waste and denudation they created. The lands became less and less productive, and plains only remain where general cultivation and dense population long existed, and finally the population declined as the exhausted soil refused to yield sufficient food for its maintenance, until as at the present day a precarious existence is maintained by a sparse population. The people have become enervated in these regions, and it is not probable that any persistent or vigorous effort will ever be put forth by them to restore what their forefathers in wantonness destroyed.

It is to be regretted if this state of the case be true, that history is rapidly repeating itself in the Dominion. Not the slightest effort is being made by the people to repair the waste of our woods. It is to be hoped that when the schedules are being prepared for the next census a column will be added so that some definite idea may be arrived at as to how our country stands with regard to forest lands. In the older settled counties of Ontario, it has been stated, and, it is believed, with some truth, that there is not on an average one acre of wood to each hundred-acre farm, a proportion totally inadequate to the requirements of any well regulated country, being a wood area of only one per cent. From some statistics before us it is ascertained that Norway, which supplies England with ships' spars almost exclusively, and is the best wooded country in Europe, has sixty-six per cent. of a forest area, Sweden sixty, Russia thirty, Germany eighteen, Holland nine, Great Britain five, Portugal four. It will be noticed that although only a few names are taken from the list, the mother country is low down in the scale, and if she had to depend on her own resources she would soon come to grief, as other nations have done before her. Her position in the sea, however, does not require her to maintain forests to assist in adding to her rainfall, and her vast mercantile marine brings the various woods from South America, the United States, Canada, Russia, Norway, Sweden, and any other country that supplies the special varieties required.

Lands which have been cleared and cropped for thirty years even, become hard, refractory, and liable to destructive droughts, which were aforetime perfectly free from these

causes within the memory of living men, and even of the present occupants, who can remember when the soil was of a loose, fertile character, and fit for the production of any crop committed to its keeping. Any person with ordinary observation will concur in the necessity of arresting the progress of these changes, and I have no hesitation in saying that the results complained of are mainly due to the removal of our forests. It is candidly admitted that careless cultivation has much to do with these results, but the loss which the protection of forests supply of moisture to the soil, and a steady and constant evaporation, which gives humidity to the air, must not be lost sight of.

Ontario is setting the General Government a good example in bringing forward the question of forestry, but the Dominion should also take the matter in hand, and by some general Act protect the wood where necessary, and encourage its plantation where it has either been destroyed, or, as in the case of the North-West, where, "in the memory of the oldest inhabitant," it has never grown. It was thought at one time that the western prairies were unsuited for forest culture, but this has been quite disproved. When the heavy sod is broken up and the destructive fires which sweep these plains are arrested, it is found that certain kinds of timber live and thrive on these once treeless plains. It would be well, therefore, in making land regulations for their settlement, to introduce special inducements or exemptions, which settlers may avail themselves of, if they undertake the duties of forest tree planting. And an Act for the restoration and preservation of forest trees, passed by the General Government, is the first and most effective step that could be taken; and this would not, if wisely constructed, act in any way prejudicially or injuriously to the first occupiers of the soil.

It will be conceded on all hands that both men and animals instinctively seek the grateful shade of trees during the heated season. It is a lamentable fact that so destructive has been the woodman's axe in this country that there are hundreds of pastures without a shade-tree for the protection of the stock which graze upon them. In some countries cooler than Canada it would be the duty of members of the Society for the Prevention of Cruelty to Animals, to prosecute parties who would wilfully put animals into a field without shade. In England the Canadian visitor is struck at once with the beauty of the landscape, which everywhere is dotted with trees along the hedgerows.

The planting and cultivation of hard-wood trees for house building and economic purposes, has not yet been begun in this country, and is commonly looked upon as a work wholly for the use of posterity, and people are slow to realize that they owe any duties in that direction, arguing that posterity has never done anything for them; but this, after all, is a silly way of putting the question, and will not bear the slightest investigation. People living in towns might as well say, we will only build town halls, churches, or put in waterworks, or make other public improvements, such as parks and pleasure grounds, that will last our own day, and then fall into decay. Posterity has never done anything for us, why should we beautify and build for them? If the farmer is not utterly lost to selfishness, he would leave a goodly heritage in cultivated forest trees to his posterity. And there is hardly a tree that can be planted which will not amply repay its planter, if properly reared and protected, in the space of from fifteen to twenty years.

It is not difficult to realize the day which must shortly dawn upon us, owing to the heavy demands made on our forests, by the progress of the country, which will make good timber scarce, and quite as valuable here as it is in the European markets. And it is the duty of either the State, or the people, to see that that day is amply provided for.

The destruction of forest trees in Canada is quite deplorable. There is no doubt it has in this as well as in other countries diminished the rain fall, while freshets become greater, though not so lasting. Many streams with ample water power for the whole season twenty or thirty years ago, now only afford sufficient force to turn the mills on them in spring and autumn, whilst others have quite dried up. In Missouri it is stated that the removal of trees has been the cause of the shrinkage of the rivers there, less rain fall, hotter summers and colder winters—and this has no doubt been the case here. The influence of trees on climate proceeds from, 1st, their removal causes quicker evaporation; 2nd, the winds have more sweep in winter. Steady evaporation in summer produces a cool atmosphere. Trees have the effect of breaking the clouds as they pass over.

Two remarkable instances are on record as to the advantages of tree-planting. The town of Valencia, in South America, is situated about one and a half miles from a beautiful lake which was surrounded by a dense forest. The trees were removed, and in the course of time the waters receded four and a half miles. The trees were afterwards replanted and in the course of twenty-two years the lake returned to its original boundaries. The other instance is the Delta of the Nile, which was dry and arid until planted some thirty years ago with trees It is now said to be well watered with refreshing showers. In India the British Government always plant trees along their extensive canals for irrigating purposes, to check evaporation, and to beautify the country.

The seed of all kinds of trees should be sown as soon as practicable after being gathered. Exposure to the air hardens their outer coverings. When, however, owing to their ripening so late in the season that they cannot be immediately planted on account of frost, they should be preserved in such a way as to keep their vitality, and remain fresh and plump. This may usually be done by keeping them from the air in dry sand, in boxes, in a cool cellar.

Some seeds, such as the elm, ripen early in summer, and must be sown immediately, so that they may make good growth before winter sets in.

The European larch is probably one of the best trees obtainable for forest culture or for barren and broken lands. This tree is quite similar to our native tamarack in appearance, but is probably more suited to dry exposed situations on account of its denser foliage. In the States it is being planted by the million. Its rapid growth is quite remarkable. It is estimated that it will grow half an inch in diameter yearly for the first ten years, and one inch yearly for the next ten. It is durable, tough and strong, and well fitted for almost all building purposes, and would make the best of fence posts or railway ties. At two years old they may be purchased at from $10 to $15 per thousand. They are readily transplanted if lifted early in the spring, and their roots never allowed to dry in the least; this may be prevented by dipping them in thin clay mud before setting. The rows should be four feet and half apart and one foot apart in the rows. A man using the spade, and a boy handling the trees, may set 2,000 per day if the ground has been properly prepared. They will need weeding in May and June, for from two to four years, according to the weediness of the soil and the growth of the trees. It takes 8,000 plants for an acre, and the cost would be $80 for plants; ploughing and harrowing before setting, $4; setting, $8; ploughing, hoeing and weeding, first year $8, second $4, third $4. Interest on land at $50 per acre for eight years, $32. Total cost per acre at eight years, $140. Credit during that period 3,000 plants at $20 per 1,000. After two years growth, $60 (these are to be set in other ground). If allowance is made for 1,000 dying they will be two feet by four and a half apart. When eight years old they will be from two to three inches round, and from fifteen to twenty feet high. 2,000 more may then be removed, leaving them four by four and a half feet apart. At five cents apiece, these would fetch $100, so that at eight years old an acre has cost $140 and is credited with $160 for trees sold. Those replanted at two years from setting should be placed at four by four and a half feet; they would then cover about one and a half acres and would cost for setting and cultivating, two years, about $100.

To succeed in raising healthy plants it is essentially necessary that their seed be deposited in a deeply worked, light loamy soil. No half way measures should be tolerated in this respect. The seeds should be sown in drills; and if hand culture is to be practised, eighteen inches apart would be a good distance. The depth of planting will be regulated by the size of the seeds. Small seeds may be covered an inch deep, and acorns and nuts two inches. The earth should be firmly pressed over the seeds by a light roller. Very small seeds, like the birch, may be sown on the top of the ground, and raked and then rolled, which will keep the moisture of the soil from evaporating too readily. The young trees will require the usual care bestowed on other crops, such as weeding, hoeing and raking, to keep the surface loose, so that the rain fall may not run off.

Small trees are easier moved than large ones, and should be set out in nursery rows after two or three years old, or even in their final position if cattle can be kept away from them.

Trees for avenues and road sides, will require to be from eight to twelve feet high before they are placed in their permanent position, and should be taken from the nursery rows as required for these purposes, but when thickets or belts are required it is best to set the trees at once from the seed rows in their permanent places.

The best practical mode of securing a rapid and effectual artificial plantation is to thoroughly prepare the soil by ploughing, harrowing and manuring as if for any other farm crop, as trees will not thrive apace on poor land, and when quick returns are required, attention must be given to the first principles of their cultivation. The plants should be set in rows three feet apart, and if they are three feet high but little pruning will be required. Fine timber can be secured with as much certainty as fine corn, if thickly planted, and if a due regard is had to judicious trimming as the trees increase in size, together with pruning such branches as seem to interfere with the symmetrical growth of the trees. Unfortunately the subject of forest growth has not yet received that attention which the denudation of our lands in Ontario requires.

The cultivation of basswood is an industry that would well repay any one to go into. Besides being a valuable shade tree, it is getting to be one of considerable commercial value as one of our best forest trees for the manufacture of paper. At the neighbouring town of Georgetown I had the pleasure of witnessing the mode in which it was manipulated at the paper mills of Mr. Barber, and he told me he did not think the supply about there would last over three or four years. Every one who has cut down this tree will remember how readily it suckers from the stump. Our able and practical President, Mr. P. C. Dempsey, informs me that if these are removed with a sharp hand-axe early in the spring leaving a small portion of the old wood for what is called a heel, these cuttings will readily grow, and in a few years pay a good profit, as the market is assured. It is a rapid-growing tree, and I fancy in ten years those which are thinned out would be of sufficient size for the paper mill.

The best native trees for cultivation are the sugar maple, white ash, black walnut, sweet chestnut, butternut, hickory, and the oaks.

Maples and elms may be pulled by hand from the woods in autumn when six or eighteen months old, and set in nursery rows, and unless very large quantities are required, farmers will find this the best way of procuring most seed-bearing trees. The nuts, being more easily gathered, may be easier collected and planted. The black walnut is one of the easiest grown trees on the continent, and decidedly the most valuable, as it does not require a long straight stem without branches as most other trees do for economic purposes. The more knotty it is the more valuable is the wood. It is also a rapid grower, and with anything like good cultivation will make eight feet in three years, when it can be set out and left to itself.

Many of the seeds of valuable timber and ornamental trees ripen during the months of September and October; amongst these may be mentioned the horse chestnut, the birch, the ash, the beech, the oak, the butternut, the black walnut and the sweet chestnut. It will be well, therefore, for those contemplating the rearing of a large quantity of these from the seed to be on the lookout during summer for suitable trees to gather seeds from. The seeds should be planted as soon as obtained, and for that purpose ground ought to be prepared beforehand to receive them. The planting should be made in rows of a sufficient distance apart to admit of the hoe being used between them, and the soil should be made rich and light by being well and deeply worked. A generous treatment of the soil for a seed-bed cannot be too strongly insisted upon.

Trees of medium age should be selected to gather seeds from, as those taken from trees which are too young often prove barren, whilst those from trees of a mature age frequently furnish plants of weakly growth. Nuts, and seeds such as ash, often refuse to germinate until the second year, so that all hope should not be lost if the first season's crop should not prove a success. So soon as the leaves have fallen, and the wood is well ripened, cuttings may be made of the various kinds of willows and poplars; these should be made about eighteen inches long, of the present years shoots, and inserted one foot in the ground. The great success in growing all cuttings is to have the earth firmly deposited at the base of them, and for this purpose the trench in which they are set should be only partially filled and the soil pressed down with a suitable instrument, and then filled up tightly. A

piece of slab or board six or eight inches wide and two inches thick, sawn squarely across one end and tapered to a handle at the other makes a handy implement for setting all kinds of cuttings. These should be planted from six inches to a foot apart, in rows, so as to allow the hoe or cultivator to pass freely between them; from two to three feet between the rows would be found a suitable distance both for cuttings and seeds. It would be well if more attention were given to nut-bearing trees, amongst which are some of the best for timber, and the handsomest for shade and ornamental purposes, and the fact of their bearing nuts should be no detriment to their being cultivated. Who cannot recall the days of his youth when he sat over the winter evening fire cracking his nuts and chaffing his girl? But the nut-bearing trees are getting scarcer as the evenings grow longer, and now there are fewer nuts to crack than formerly; but there is no reason why the rising generation should not have quite as much innocent amusement as their fathers had before them, if only a little judicious forethought were exercised. Most of the nut-bearing trees grow rapidly. The writer has seen a growth of six feet made on a young black walnut since last spring, and a growth of this length is no unusual sight on young butternut trees. The writer has some young plants of this variety, the nuts of which he planted seven years ago. The trees had catkins on them this spring but did not bear. He has no doubt they will be productive next year. These trees have been twice and three times transplanted, and for the last few years have been growing in a heavy lawn sod, so that although the soil was good the experiment was not on the whole favourable to the rapid growth of the young trees. The wild sweet chestnut, whose fruit, though small, is of excellent quality, is a very rapid grower where soil and climate are congenial, and will stand the winters very well along the St. Lawrence river front as far east as Cornwall, and is quite suitable for planting all over the western peninsula as far north as Owen Sound. The timber of this tree cannot be excelled for furniture, and is chiefly used for bed-room sets. It has a fresh, light and neat appearance when oiled and varnished, which brings out its large open grain, and its peculiar rich yellow hue gives it a cheerful appearance. A firm in Detroit manfuactures from this wood very largely.

We would recommend the raising of all nut-bearing trees from the seed, and transplanting them to their permanent position when from four to six feet high, as these trees are not considered as a rule so easily removed as the seed bearing varieties, although we know of some set out at ten to twelve feet high with very good success, but they had been root-pruned and reset before. We believe any one wishing to obtain nuts of the black walnut or butternut, or young trees, may get an almost unlimited quantity at a trifling cost from Chief Johnston of the Six Nation Indian reserve at Brantford. Our Experimental Farm at Guelph should procure a couple of bushels of nuts for planting, in order to shew the general public how readily they can be grown, and with what rapidity the denudation of our forests can be restored. The variety, date of planting, etc., should be kept on a stake at the end of the row so that visitors could see at a glance the progress made from time to time.

The time was fully taken up in the discussion of the importance of planting trees for shelter, and the several kinds of trees, native and foreign, that may be cheaply and profitably planted.

It was stated that in many places a demand had sprung up for soft woods, such as basswood and poplar, for the manufacture of pulp for paper, and that, often, broken land that cannot be profitably tilled could be planted with these rapid-growing trees with great profit. Many young trees of ash, maple, hickory, etc., could be taken up by farmers and planted for a couple of years in nursery rows where they could be cultivated, and then transplanted to broken ground and hill sides, with great certainty of living.

Mr. Beall mentioned an instance of a farmer who, desiring to have a belt of trees for the shelter of his orchard, fallowed a strip of the desired width and then covered it with leaves and surface soil from his wood lot, and in a few years it was densely covered with a growth of young trees.

At the close of the discussion the meeting expressed its opinion in the following resolution:—

Resolved, that the members of this Association are deeply impressed with the importance of encouraging the growth of forest trees in this Province, believing that they

exercise a very decided influence on temperature, and furnish valuable shelter for our field crops and fruit trees. We also regard this subject as an important one from an economical standpoint, and believe that general forest planting in those portions of the country which have been almost denuded of woods would soon add very much to the value of land, and become before long a constant and increasing source of revenue. In this way also much land now of little or no value on account of its rough, hilly, or stony character, could be utilized with great advantage to the owner.

Some conversation was also had upon the encouragement of tree planting, the tenor of which was to the effect that it could be best done by placing before the public the necessary information with regard to the value and feasibility of such planting, and the profit that would result to the planter.

How to popularize the study of forestry among the sons and daughters of farmers was also considered, and the meeting was of the opinion that the introduction of a class-book on this subject into our common schools would do more than anything else to impart knowledge, and so awaken an interest on the subject; and upon motion of Mr. Beall the meeting requested the President and Directors to confer with the Honourable the Commissioner of Education upon the introduction of such a class-book.

REPORT ON NEW FRUITS EXAMINED DURING THE SESSION OF THE AMERICAN POMOLOGICAL SOCIETY AT ROCHESTER, N.Y., SEPTEMBER 18TH AND 19TH, 1879.

PEACHES.

Forty-four Seedlings originated by J. D. Husted, Lowell, Kent Co., Michigan, from cross of Hill's Chili upon Hale's Early in 1875. They are in season between Hale's Early and Crawford's Early and are all of good quality. The majority are either reproductions or slightly modified forms of Hill's Chili.

Wheatland.—From David Wheatland, N.Y. Very large, yellow, resembles Crawford's Late.

Mrs. Brett.—From J. H. Ricketts, Newburg, N.Y. Large, white with red cheek, very juicy, sub acid, very good.

GRAPES.

Lady Washington.—Originated by J. H. Ricketts, Newburg, N. Y. A cross between the Concord and Allen's Hybrid. Bunch very large, compact, shouldered; berry medium to large, deep yellow, pink where exposed to the sun; flesh tender, juicy and sweet, and very good. Vine vigorous, hardy and productive; leaves large and thick. Promising for the market and the amateur.

Jefferson.—Also from Mr. Ricketts. A cross between Concord and Iona. First fruited in 1874. Bunch large, not very compact. Berry of medium size, deep pink, very vinous. Quality best. A showy variety. Foliage of *Labrusca* type.

Bacchus.—From the same grower and origin. An accidental seedling of Clinton. Bunch medium; berry medium, blue black, very vinous, and promising as a wine grape. Foliage of *cordifolia* type.

Naomi.—From the same grower. A cross between Clinton and Muscat Hamburg. Bunch large, loose; berry medium size, green tinged with bronze. Very juicy and high flavoured. Quality best. Foliage of *Labrusca* type.

No. 1 B.—From the same grower. A cross between Hartford Prolific and Clinton. First fruited in 1877. Bunch large, cylindrical; berry medium, white, good. Foliage *Labrusca.*

No. 254.—From the same grower. A cross between Martha and Sultana. First fruited in 1874. Bunch large; berry small, yellow, very juicy and high flavoured; seedless. Quality best. Foliage of *vinifera* type. Vine vigorous but only half hardy.

Noah.—Originated by Mr. Wasserzieher, at Nauvoo, Illinois. A seedling of Taylor. First fruited in 1876. Bunch medium, compact; berry medium, yellowish green. Resembles Elvira, but hardly equal to it in quality. It gives promise of value as a wine grape.

Dutchess (named from Dutchess County).—Originated at Poughkeepsie, N.Y., in 1868. A hybrid between a White Concord Seedling and Walter. Bunch large; berry above medium size, greenish white, flesh breaking. Very juicy, vinous. Quality very good.

Poughkeepsie Red.—Of the same origin as the preceding. A hybrid of Walter and Iona. Bunch medium, compact, shouldered; berry medium, pale red, vinous, sweet. Resembles Delaware and of equal quality. The foliage resembles Delaware.

Rochester.—Originated with Ellwanger & Barry, Rochester, N.Y. An accidental seedling. Bunch large, compact, shouldered; berry above medium size, reddish amber. Very juicy and of good quality. Vine hardy and very prolific. The foliage resembles Delaware.

Monroe.—Of the same origin as the preceding. Bunch medium, compact; berry large, blue black, subacid, vinous. Quality good. Vine hardy and vigorous.

Niagara.—Originated by Messrs. Hoag & Clark, Lockport, N.Y. First fruited in 1872. A cross between Concord and Cassady. Bunch large, compact, shouldered: berry large, yellowish white. Flesh sweet and juicy. Quality good. Foliage large, lobed, very pubescent. Matures with Hartford.

Pocklington.—Originated by John Pocklington, Sandy Hill, Washington Co., N.Y. A seedling of Concord. Bunch very large, shouldered, compact; berry very large, yellowish white. Flesh pulpy, juicy and vinous. Quality hardly good, but the specimens were not fully ripe. Two of the members of the Committee, Dr. Burnet and Mr. Bateham, stated that they had seen the fruit in finer condition. A very showy fruit. Foliage very large and pubescent.

Hybrid Seedling.—From Dr. W. A. M. Colbert, Newburg, N.Y. A cross between Iona and Muscat Hamburg. Bunch large; berry large, purplish black; pulp dissolving. Quality very good.

Lavega.—A hybrid seedling. From W. H. Mills, Hamilton, Ontario. Bunch medium; berry large, reddish, vinous. Quality very good. Vine hardy.

Seedling No. 3.—From William Haskins, Hamilton, Ontario. Bunch and berry large, white, vinous and high flavoured. Quality best. A hybrid. Vine hardy.

Seedling No. 10.—From the same grower. Bunch and berry small, white, very sweet; skin tough. Quality very good. Vine hardy.

Burnet.—From P. C. Dempsey, Albury, Ontario. A cross between Black Hamburg and Concord. Bunch large, loose; berry large, purplish, vinous, very juicy, very good. Vine hardy.

Seedling No. 60.—From the same grower. White, vinous, very good. A hybrid. Hardy.

Hybrid Seedlings.—From C. J. Copley, Stapleton, N.Y.

18 F.—Berry very large, black, good. *Labrusca* foliage.

14 F.—Bunch large, compact; berry large, greenish white, lacks flavour, but may be better in a good season.

Twenty-one Seedlings—From W. G. Hulkerson & Co., Oriel, Michigan. These originated from a single bunch of Wilder (Rogers' No. 4) and show considerable variation in size and colour of berries, ranging from deep blue black to red. While none are improvements upon the parent, the results are such that future experiments in this line should be continued and encouraged.

Prentiss.—Originated by J. W. Prentiss, Pultney, Steuben Co., N.Y., is a seedling of Isabella. Bunch medium, compact; berry medium, yellowish green; skin thick; flesh pulpy, but quite dissolving, juicy, sweet with some flavour. Quality good to very good. Belongs to the *Labrusca* type. Ripens with Concord and keeps well. Vine is very hardy and very prolific. A promising white grape.

Numerous other specimens of new varieties of grapes were examined, but being either inferior in quality or in an unsound condition, they are not mentioned in this report.

LEMON.

Olivia.—From George C. Swan, San Diego, California. Specimens very large and of fine appearance and said to contain sixty-five degrees of citric acid. The Committee not having any means to test these fruits can only commend the sender for his interest manifested in the progress of horticultural products.

P. J. BERCKMANS.
SAMUEL HAPE.
SYLVESTER JOHNSON. } *Committee.*
ROBERT BURNET.
M. B. BATEHAM.

FLOWERS IN PUBLIC HALLS.

By B. Gott.

The many lovers of good manners and fine public taste everywhere, cannot but be deeply pleased by the prospect of the many exhibitions of flowers in public estimation and in public morals. Wherever we go, either in summer or winter, these beautiful objects of Divine beneficence accompany us, and are to be found to a greater or lesser extent: they thrust themselves upon our observation, and command at once our serious and devout attention. Their use in public halls and so in public assemblies, is apparently much on the increase. A simple social gathering of friends is made more pleasing, and has better remembrances clinging around it, by the presence of a few pots of choice flowers. They are made to do duty by increasing the native attractiveness on the brow of bridal beauty; and on the lifeless clay of departed friends they are equally serviceable to spread everlasting loveliness. The sportive and guileless child, on the very threshold of its happy being, stops to pluck and admire the gay flower, spotless as itself; and the cultured and well-trained sage of the school is equally curious to know and examine its wonderful and mysterious parts and properties. Even the ignorant, the vulgar and the debased, are attracted by such displays of wonderful beauty and spotless purity, and are thus frequently made to reflect on their own sinful and impure ways. In the beautiful words of Horace Smith:—

> Your voiceless lips, O flowers, are living preachers,
> Each cup a pulpit, and each leaf a book,
> Supply to my fancy numerous teachers
> From the loneliest nook."

In this way are the humble, inaudible flowers of the field accomplishing their double mission of ornamentation to the earth and moral instruction to wayward and erring humanity. Either a man must forever banish himself from the enobling society of flowers, or from the degrading influence of evil society and ways. Those opposing influences cannot coalesce, and a morally degraded being cannot love the presence of the beauty and loveliness of flowers. Said a friend to me a few days ago, "A genuine lover of flowers cannot be dangerous company." At present we shall not attempt a reference to flowers in the public parks of our cities, or our public cemeteries, the quiet resting place of our honoured dead, many of which places are beautified and richly adorned by the varied forms and beauty of flowers; but we must confine ourselves to the subject-matter in hand, "Flowers in our Public Halls."

Firstly, Flowers in our banqueting halls.—It is said of the admirable Lady Dufferin, the popular companion of our late Governor-General of the Dominion of Canada, that she had a very heavy stock of admirable pot plants, which was made to serve the purpose of decoration on her tables at the public gatherings of the nobility. The same is also said to be the right royal taste of the wife of our present Governor-General. We may be pardoned for making use of a description of a grand festival held by the Massachusetts Horticultural Society, at Faneuil Hall in Boston. "At this grand festival six hundred ladies and gentlemen sat down to a sumptuous feast. The tables, fourteen in number,

were loaded with every delicacy of the season, but the crowning glory of all was the great profusion of delicious fruit, and magnificent display of gorgeous flowers. The scene was exciting and brilliant." The Hon. Daniel Webster said, "I congratulate you, Mr. President, that our flowers are not

. . . . 'Born to blush unseen,
And waste their fragrance on the desert air.'

"Our flowers are cultivated by hands as delicate as their own tendrils, viewed by countenances as spotless and as pure as their own petals, and watched by eyes as brilliant and full of lustre as their own beautiful exhibition of splendour. All our associations of beauty and taste are blended with flowers. They are our earliest token of affection and regard. They adorn the bridal brow at the wedding, they are woven in garlands around the head of the conqueror, they are strewed on the coffin of the dead, and here is another of their most grateful and beautiful uses—ornamenting a table at a festival and enlivening the scene and enchanting the eye." From an adddress by Hon. Caleb Cushing: "In that 'central flowery land' this is the case at all festivals, flowers there adorn the table and meet the eye in every direction on all occasions, but here alone—here and in other Christian lands—woman enchants and beautifies with her presence the scene. We have learned to admire art, to appreciate sculpture and painting, and to look upon fruit and flowers as models of delicacy and beauty." Such are the sentiments and statements of the refined and eloquent, and such are the growing sentiments of our people in this country.

Secondly, Flowers in our educational halls, our school rooms and our lecture rooms—We have frequently seen on the expressions of childhood the pleasing smile, the grateful sense of pleasure, on the presentation of a carefully selected bouquet of flowers, to adorn the teacher's desk in the school room. Their place here is educating and refining, and the influence upon the children is grateful and ennobling. On our lecture-stands, too, there is a place on either side of the speaker for a vase of flowers.

"Flowers" says a writer, "of all created things are the most innocently simple, the most superbly complex, playthings for childhood, ornaments for the grave and companions of the cold corpse. Flowers are beloved by the child and studied by the thinking man of science. Flowers that unceasingly expand to heaven their grateful, and to man their cheerful looks, soothers of human sorrow; fit emblems of the victor's triumph and the young bride's blushes. Welcome to the crowded hall and grateful upon the solitary grave! Flowers are in the volume of nature, what the expression 'God is love' is in the volume of revelation."

We should then studiously encourage our children to cultivate, to gather and to study the flowers of the field, whose influence upon them and their character is so grateful, ennobling and virtuous. We love to see them conspicuous in our school rooms, as a tribute of gratitude and love, and we would fain to see them intelligently placed on the table of every educational hall in the land.

Thirdly, Flowers in our restaurants and dining halls, our public places of refreshment and our bar-rooms.—In good houses of this character, throughout the United States, the practice of placing fine pot plants of rich bloom in their rooms, and on their tables and bars, is fast becoming very common, and we think justly and with the best of influences and results. Having occasion lately to step into a restaurant room for refreshment in the town of Sarnia, Ontario, we were at once struck by the cosey, homelike, comfortable aspect of the general outfit of the room. It was handsomely furnished and perfectly equipped with everything needful for the comfort and refreshment of the guests, either in the cold or warm season. One end of the room in close proximity to large fine front window, was totally taken up with stands of as valuable, healthy and handsome pot plants as we had ever seen. These were admired by all. The influence of that stand of beautiful plants was in itself refreshing, and our active thoughts were speedily carried to their counterparts on the stand watched and tended by the loved ones at home. Who can properly estimate the potent influences for good and virtue daily hovering around that stand of plants. May the time soon come when many such exhibitions of floral beauty shall be met with in all our public places of resort, encouraged by the voice of fashion and public good taste.

A few days ago in our business tours we had occasion to step into the public bar-room of one of the public hotels in Thedford, Ontario. Our curiosity was at once aroused by the spectacle of a quantity of fine choice pot plants standing in the windows and on the bar. This, in our opinion, is a move in the right direction, for in a general way in no place of public resort are the tender, refining influences of plants and flowers more in requisition than in our public bar-rooms. We do not wish to uphold the bar-room system of the present day, where men gather solely to imbibe unnatural and diseasing stimulants, to their evident injury, but if they are a necessity of the age, and legalized by an enlightened Government, we do hope that it may become popular to connect therewith all the redeeming and refining influences possible. In the immediate presence of the forgetting man, drinking himself into unmanliness and brutality, stands the pure, silent and potent preacher, the flowering plant, that is so much like the one his loving and patient wife watches at home, or the one his dear kind mother praised and fussed over until he almost knew every leaf upon its stately stem, and every petal upon its sweet and beautiful corolla. If he but turn his eyes upon them he feels silent reproof for his ingratitude to admonishing maternal influence, and in shame he returns to wounded affection. As a late writer has it, "With tender emotions do I remember the old white rose bush trained to the top of the house by the hand of a dear mother. How many pleasing reminiscences crowd upon the memory of one who, at the age of three score years and ten, looks back upon the scenes of his childhood and youth, when from his sainted mother he received lessons of morality and piety, while engaged in the cultivation of a limited flower garden. Let us then with joy contemplate these ennobling and refined influences, even in the public halls of entertainment, and in every possible way encourage them in this relation, for they do a silent but reproving work that sterner influences cannot do. We want to see them placed everywhere, where human character can be formed, and at all seasons of our variable Canadian year. At no time, or place, or season, can we safely afford to do without an influence so redeeming and divinely good.

ADDRESS DELIVERED BEFORE THE HORTICULTURAL SOCIETY OF WESTERN NEW YORK.—JANUARY, 1880.

By James Vick.

Man may be happy without a garden; he may have a home without a tree, or shrub, or flower; yet, when the Creator prepared a home for man, made in his own image, He planted a garden, and in this placed the noblest specimen of creative power, to dress and to keep it, and there he remained during his life of innocence and happiness. And, in all parts of the civilized world, the refinement, and innocence, and happiness of the people may be measured by the flowers they cultivate. The love and care of flowers is one of the few pleasures that improve alike the head and the heart. It is a pleasure that brings no pain, a sweet without a snare.

Wonderful changes have taken place in our country within the memory of some who do not think themselves very old, and who have but recently stopped pulling out the grey hairs, as a hopeless task. The huge chimney, made of rough stones, with its log cabin attachment, the well sweep, the rail fence and bars, the wood-pile with its mound of chips and rusty old axe, useful for the boys when out of school, have all disappeared. The pigs no longer seek admittance at the front door, nor demand a first chance at the dinner—having snuffed its fragrance from afar—in language more expressive than elegant; even the music of the spinning wheel is hushed.

We have nothing to say against log cabins. They were proper for a new and wooded country, and quite picturesque—a necessity and a blessing. Many noble men have commenced life in log cabins, but we observe that they did not stay in them longer than necessary. But the log cabin is gone, never to return. It long ago gave way to the square box, painted red, or, if unusually pretentious, pure white, adorned with blinds of the most intense green. The yard was cleared of chips and surrounded with a board fence, a straight walk leading from the street to the front door, while a few beds, bordered with

shells or stones, contained Poppies and Bachelor's Buttons, and Grass Pinks, and Sweet Williams. A few Hollyhocks and Lilacs added both beauty and fragrance to the little home garden. A border in the background contained Thyme, and Sage, and Summer Savory and similar treasures for the good woman's culinary uses, while a patch of Tansy and Peppermint were quite as necessary for the good man's bitters.

But change and progress is the order of the world, especially of the American world, and the old house that the carpenter made in the similitude of a dry goods box became worn out, or too small, or too very unfashionable; and the architect designed, and the builder erected a new house, with towers and gables, and curious porches, and strange windows, that one might almost think an emanation from fairy land. The old flowers are discarded with the beds and borders of whitewashed stones, and even the fence has been removed to the pasture lot. The front yard has become a lawn, and the tansy and peppermint bed have been transformed into a parterre. Instead of flowers a few weeks in the year, as in the olden time, there are now unbroken beds of beauty from early spring until the frost-king lays his cold hand upon every leaf and flower.

The change has done much to make people better, healthier and happier; but its speediest and happiest effects are with the women and children, while the men are enjoying in many cases the blessings they do not appreciate, and sometimes do not deserve. A few there are who try to show their manhood by a contempt of beauty. They are, however, remnants of a race almost extinct, and we say, peace to their ashes. Men of intellect and refinement are helpers in the good work, and nobly aid the weaker ones in making homes of beauty. A few suggestions as to how this can best be done will be in place.

The foundation of modern gardening is good walks and good lawn, and as both will last as long as the maker, it is well that the work should be well done. First secure good drainage, and then determine on the walks, making no more than actually necessary. Stake out the lines, and remove the earth twelve or eighteen inches in depth, using the earth thus obtained to fill up any depressions. Dig or plough quite deeply the ground designed for a lawn, and pulverize the soil thoroughly, removing all stones to the trenches prepared for the walks. Place a narrow margin of grass on each side of the walk, so as to secure the outline; see that the surface, at least, of the soil intended for the lawn is mellow, and will not bake. Sow Kentucky blue grass and a little white clover, or the prepared lawn grass of the seedsman, at the rate of four bushels to the acre. After the walks are filled with rough stones to within four or five inches of the surface, cover with fine gravel until the centre is level with the surface of the lawn. This work is best done very early in the spring, so as to give the grass seed the benefit of spring rains, or it may be done in September. If the soil is very stiff, it is well, after sowing the seed, to cover the surface with an inch of fine manure, and this should remain, after raking off a little of the coarest, during the summer, if it seems necessary. This plan is almost essential to success in the south and California, and other warm and dry sections. If the work is well-done, by the last of June the lawn will look well and require cutting. Weeds naturally appear, but as they are mostly annuals, if the grass is kept short they cannot seed and will soon disappear. A few perennials, like dock and plaintain, should be removed by hand.

Having obtained a good lawn, the usual practice is to spoil it as soon as possible, by making unnecessary walks and flower beds, and by excessive planting of trees and shrubs. Grass cannot grow in dense shade, and no lawn can look well cut up by narrow walks. A good portion of the lawn, if possible, should present an unbroken surface, only an occasional and handsome tree being admitted, and at such distances apart that they can grow and become perfect in form; and let no desecrating hand mar the work of the Creator by the saw, nor touch an ornamental tree with a pruning knife. This should only be allowed under such circumstances as would justify the amputation of the limb of a friend. The shrubs should be in clumps, or groups, and so thickly planted as to cover all the ground, and the soil under them kept cultivated and clean, like a flower bed. A few flower beds may be made, and usually near the borders, or opposite windows, and they should be of simple, graceful forms, and look well the whole summer, and every day and all day. There are many beautiful flowers that bloom only for a few days, or weeks, and, however desirable they may be in certain places, are unfit for beds on the lawn.

Others are in flower a long time, but the flowers are not sufficiently abundant, or are hidden by the foliage. Some kinds, though they flower freely, cannot endure the full blaze of the summer sun, and are, therefore, unfit for this work. Of all flowering plants, the scarlet geraniums have been the most popular for bedding, and the most freely used in all parts of the civilized world for making lawn beds, so much so that the opponents of the system have denounced it in ridicule as the "scarlet fever."

Through the skill and enterprise of florists, we now have many varities of plants with bright and beautiful foliage. Among these are the variegated-leaved geraniums, Achryanthes, Coleus, Centaureas, and Golden Pyrethrum. The Achyranthes is a darkish purple or maroon; the Coleus gives a very wide range of colour; Centaurea is snowy white, and Golden Pyrethrum, yellow. It will be readily seen that with such material most charming beds of colour can be formed. These beds and borders are often formed of rows of plants or flowers of different colours, and are then called ribbon-beds, and, when the patterns are more intricate, carpet beds, and they are often gorgeous.

Another style of lawn bed, and perhaps the most magnificent of all, is composed of large sub-tropical plants. They give us a taste of the luxuriance of tropical foliage, and, on lawns where there is sufficient room, nothing will afford more pleasure. These beds are usually planted with Ricinus for the centre, then Cannas, followed by *Caladium esculentum*. A low, outside border may be composed of Centaureas or Coleus. The Ricinus is obtained from seed, and will grow about as freely as corn, and require about the same soil and warmth. For earliness it is sometimes started in pots. The dry bulbs of Cannas and Caladiums are obtained from florists, and young plants of Coleus or Centaureas are to be had quite cheaply in the spring.

The plants desirable for bedding are not expensive, and good flower beds and ribbon beds can be made of annuals at the cost of a few cents, and for this not many equal the *Phlox Drummondii*. A few rows of white, purple, and scarlet will form a ribbon bed of great beauty, and the product of a paper of Petunia seed will make no mean show, if properly cared for.

These beds, it must be remembered, are for the adornment of the grounds alone, and they furnish no flowers for the house—no presents for friends, no bouquet for the dining room, or for schools, or churches, or the sick-room. These we must have. So, just back of the lawn, make generous beds of flowers that you can cut freely—Asters, Balsams, Zinnias, Stocks, Mignonette, Sweet Peas, etc.

The great difficulty with American gardens is that they are too large, and not sufficiently cared for. If we gave the same amount of labour on a quarter of an acre that we now expend on an acre, the result would be much more satisfactory. No one should have more ground in garden than he can keep in the very highest state of cultivation. It is this kind of excellence that affords pleasure, while failure or partial success is a source of pain. It is not only a fault to cultivate too much ground, but even too many flowers. Some seem anxious to obtain and grow everything. This is not well, especially where there is not a good deal of time and money to be devoted to the work. A choice selection is best, and we like every cultivator of flowers to have a pet or hobby. Always have something choice—something grown better than anyone else is growing it—something you have reason to be proud of. It will astonish you to see how flowers thrive under such petting, and what wonderful exhibition they make of their gratitude.

We name a few plants suitable for special garden work. These lists embrace but a few of the many adapted for the several purposes indicated.

Dwarf Plants for Edgings or Borders of Beds.—Alternanthera, Armeria or Thrift, and Pyrethrum aureum.

White-Leaved Plants.—Glaucium, Centaurea, and Cineraria maritima.

Showy-Coloured Foliage.—Achyranthes, Coleus, and Bronze and Silver-leaf Geraniums.

Scarlet Geraniums.—Gen. Grant, Queen of the West, and Excelsior.

Tall Foliage Plants.—Caladium esculentum, three to four feet in height, leaves more than two feet in length. Cannas, from three to five feet in height; a variety called Robusta, from five to eight feet. Ricinus, Castor-oil Bean, from six to twelve feet.

Annual Flowers for Brilliant Show.—These are, doubtless, familiar to most of our readers. The Aster, Antirrhinum, Balsam, Dianthus, Delphinium, Pansy, Petunia, Phlox Drummondii, Portulaca, Salpiglosis, Stock, Verbena, Double Zinnia, and other varieties that we have not space to name, should be in every collection.

Flowers Desirable for Fragrance.— For fragrance nothing equals the Mignonette, Sweet Alyssum, Sweet Pea, Erysimum, Stocks, Pinks, Picotees, and Carnations.

Ribbon Beds.—A very pretty ribbon bed is made by taking different colours of the same flower, like Phlox, Portulaca, Stocks, or Asters.

In conclusion, we say to all, cultivate flowers. These children of the field speak to us in every fragrant breath and lovely tint, and graceful form, of Him who spoke from naught such matchless beauty.

AMBER CANE.

To the Editor of "The Signal."—During last winter I noticed several letters in agricultural papers about raising Amber Cane in Canada and the States with the object of making sugar and syrup from it. I encouraged my neighbours to try it; last spring I sent to a Detroit seed firm and obtained 4 lbs. of Amber Cane seed. I paid 50 cents a pound and 20 per cent. duty. About the 18th May I planted about half an acre in well manured mellow land; the rows were 3½ feet apart. I put 8 or 10 seeds in each hill and thinned it out after it came up to 4 or 5 stalks in each hill. It looked puny and tender for a few weeks, but when the hot weather came it grew very rapidly. About six rods of the ground was too wet and it rotted. It requires about the same cultivation as Indian Corn and will ripen about the same time. Mine was fully ripe in the middle of October. I saved considerable of the seed. The average height of stalk was 10 feet 2 or 3 inches. Two other parties grew some near Clinton this season and one of them has machinery for pressing and manufacturing it. I took my cane to him and had it converted into syrup, receiving half the product. I got 35 gallons of good syrup. If the seed is good 1 lb. will plant an acre. My farm is two and a half miles from Lake Huron; we seldom have spring or summer frosts. Please insert this for benefit of readers of the *Signal.*

GEORGE COX, *Goderich Tp.*

We have, by kindness of Mr. Cox, received a sample of the above mentioned syrup and although made after a very crude fashion it has the appearance of the ordinary Amber Syrup of commerce. It is quite palatable and pleasant, and seems devoid of a certain pungent, acrid taste possessed by much of the so-called sugar cane syrup. Mr. Cox's experiment shows a yield of 140 gallons to the acre, no doubt with a little experience in cultivation and manufacture, this could be increased. Even as it is, and allowing one half for manufacturing, the yield of 70 gallons per acre would seem to class this as a profitable branch of agriculture. Allowing 50 cents per gallon, we have a return of $35 per acre.—Ed.

THE FORESTS OF OHIO.

HAS THE TIME ARRIVED FOR THE PLANTING OF TIMBER?

An affirmative answer by Dr. John A. Warder—Address before the recent Ohio Agricultural Convention.

Having been courteously invited to appear before you and to take the affirmative in opening this discussion upon the deeply important subject of Forestry, I present myself before you with the diffidence of one who must acknowledge himself a novice in the science, and crave your patience during the few moments occupied in an endeavour to discharge the assigned duty.

In the programme for the day appears this query:

"Has the time arrived in Ohio to plant trees for timber?"

In attempting a response to a question that is as yet so new to the men who themselves have aided in clearing off the dense forests that once covered the region watered by the Ohio River and its tributaries, it can hardly be expected that one who has worked with his own hands in effecting that destruction, nor you who have looked upon the work as a necessity, should be prepared to pronounce upon the limit beyond which the clearing of the land should not be allowed to proceed. Nor is it at all likely that you may be ready to accept, much less to adopt as your own, all of the postulates and axioms that, on such an occasion at this, might be suggested and pronounced by any one who has made Systematic Foresty a subject of serious investigation.

As yet, little or nothing has been done among us in the way of forestry. Here and there a few trees have been planted, rather for ornament than for utility. The taste for the comfort and beauty of trees is growing however, and of the thousands who daily travel along our great highways, few are they who cannot admiringly appreciate the improvement by tree planting about the village stations, the groups of ornamental trees clustering around the rural homesteads, the lines of trees along the country roads, and on the boundaries of cultivated fields.

These efforts of individuals to restore the sylvan beauties of the land are worthy of all praise. They are well supplemented by the Village Tree Planting Associations happily suggested and successfully carried out by Mr. Northrup, of Connecticut, who should have many followers in Ohio. Your attention is especially directed to his pamphlet.*

Under the happy influences of the tree planters the cemeteries of our land are everywhere becoming the quiet resting places of the dead, sheltered by umbrageous trees, instead of the forlorn, desolate and neglected fields of the past—so unworthy of the title, God's Acre (Gottes Acker), and so discreditable to our boasted civilization.

Public and private parks are being set apart for the special culture of these beautiful natural objects, and they become the most agreeable resorts, and are means of instruction for the people. All these encourage a love for trees, and increase our knowledge of them, and to that extent are accessory to forestry.

In this, however, the people of our country have much to learn; the general want of familiarity with our sylvan wealth, either collectively or individually, is a matter of surprise to those who have made this matter a study.

Upon this occasion it may be admissible to refer more particularly to a single tree, which is destined to become a factor of no mean importance in the future forests of our land, and through them to solve one of the great problems of the iron road, the cross-tie question, and the future supply of sleepers.

We may be pardoned for having a State pride in this tree, for though not a native of Ohio, it was here that the distinctive characters of the Speciosa Catalpa, the western species, were first pointed out and presented to the public. It was here that it was first planted and distributed by General William Henry Harrison, who brought it from its native home on the Wabash. It was here that its merits as a perdurable timber were published by him at an agricultural meeting in Hamilton County, when he urged his fellow farmers, as early as 1825, to plant the tree extensively for its great value as timber.

It was in Dayton, Ohio, that its great beauty as a shade tree was observed by Dr. J. Haines, who propagated and distributed the plants that now ornament the streets of that city. In 1853 it was recognized as distinct from the Catalpa of the nurserymen, that had been brought from the Eastern States, and was then published in a magazine, devoted to horticulture and rural affairs,† that was printed in Cincinnati.

The Brothers Teas, enterprising nurserymen, next propagated the tree and distributed it widely. Further honours to the Catalpa and to our State have resulted from a great devotion to the timber interests manifested by Mr. E. E. Barney, of Dayton, who has bestowed much time and money, in the most disinterested manner, in the collection and diffusion of information‡ respecting this valuable tree, and in sending out its seeds, some of which have reached far distant lands on other continents.

* "Tree Planting, Economic and Ornamental, and Village Improvement," by B. G. Northrup.
† *Western Horticultural Review*, August, 1853.
‡ "Facts for Information on the Catalpa Tree."

From all which it appears, that though itself a native of another region of our country, the merit of the introduction of the *Catalpa speciosa* is due to the intelligence and energy of the citizens of our own State.

Though it is not pretended that we have originated or created a new tree, we have presented one to the world that had heretofore escaped the observation and notice of the botanist. A tree of which it is said, (by one who knows that whereof he doth affirm), "Every day's experience establishes me more firmly in the opinion that it (the *Catalpa speciosa*) will prove to be one of the very best, if not the very best tree in the middle American States, and with a southern limit very far beyond any of our northern trees.

But let us now address ourselves more especially to the question before us:

"Is it time for us in Ohio to plant trees for timber?"

Yes! Yes truly and most emphatically, my dear fellow countrymen of Ohio, the time *has fully come* when we, the inhabitants of this glorious possession, should, as a duty, plant trees for timber."

Certainly we already have many warnings that it is indeed high time for us to set about doing something toward the restoration of the forests, which the necessities of agriculture and the advancing wave of civilization have so rapidly diminished, within a century of occupation, in extensive regions of our noble State. The clearing of the lands was a necessity for its occupation and application to agriculture. In this matter, every landowner must be left free to decide for himself and for his own acres. No man, or set of men, may let or hinder him from destroying or restoring his forests. Nor can his movements be controlled by legislative enactments as in other countries, since the policy of our republic is that of *non-interference*. But we have also an axiom in our policy, that the best plans are ever those which conduce to the greatest good to the greatest numbers of the people, and, whenever these may be presented in acceptable form, it is hoped and believed that such propositions will receive support.

So great is the American statesmen's confidence in the general good sense of the people, and in the capacity for self-government, that all great questions may be safely left to the popular tribunal.

When new propositions happen to be presented to the people for solution, however, they may sometimes need a certain amount of educational training and enlightenment, to prepare them for a wise decision.

The present theme is perhaps one of that character, to our fathers and to many of ourselves, who have lifted up axes upon the thick trees and prostrated those princes of the forest which had for centuries reared their proud heads, and reigned as monarchs of all they might survey. Those of us who have laboriously cleared the land of these encumbrances, have triumphed in the unequal contest, and may well congratulate ourselves on having released the fertile soil from its forest thraldom, to receive the vitalizing sunshine, and to smile for us with productive farms and happy homes, surrounded with luxuriant fields of food crops for man's use, convenience and enjoyment.

Flushed with our triumphs over barbaric nature, such may ask, "Why plant more trees and again relegate these smiling fields to the bondage of the savageism of the forest times!"

No! this clearing of our fertile lands is indeed right and proper; it will go on, and it should continue for a *certain period* and to a *certain extent*. Whatever this extent may be must depend upon so many circumstances connected with the physical conditions of a wide extent of territory, that the problem becomes difficult of solution, and requires for its proper consideration a knowledge of many branches of natural history. It need not now be discussed; suffice it that man's experience and observations in other regions of the globe will aid us in attempting a solution. From these we learn that from one-fifth to one-fourth part of any considerable stretch of country should be occupied by trees, in order to produce the best results in the physical conditions necessary for the greatest productiveness of the soil, and for the highest development of humanity.

Applying this to our own State, let us ask, how is it now in Ohio in this respect? What is the ratio at present, between the wooded and the cleared portions of our State? The statistics of this important problem are not so complete as we could desire, but such as they are, are well portrayed in Gen. Walker's Atlas of the United States census of 1870.

In his message of last year our Governor graciously devoted a brief paragraph to this subject, a subject indeed of so great prospective importance to the future destinies of the millions who are to tread upon the soil of Ohio, that our chief executive and our legislative bodies, as well as the humblest citizens, might profitably make it a subject of laborious and continued study.

It appears that in the course of seven years the area of the woodland in Ohio was reduced from about 9,750,000 in 1870 to a little more than 5,000,000 acres in 1877.

This shows that more than 4,000,000 acres of woodland, nearly one-half of that returned by the last United States census, has been destroyed in the brief period of seven years! Should these figures prove to be correct, they shew a frightful destruction of our woodlands, which must be followed in the future by their legitimate results of altered and deteriorated climate, diminished fertility and productiveness of the soil, in some places approaching barrenness, in the drying up of springs and streams, with irregularity in the flow and discharge of our navigable rivers, and eventually in the relegation of our fertile fields to barrenness and desolation. * * * What has been *may again* and *will again* recur. The most fertile regions of the old world, when subjected to similar treatment, have reached this sad result. Under the infliction of such ill treatment and abuse of God's gifts, it is but a question of time when the sad but inevitable results must follow, and our now fertile plains be reduced to deserts.

The traveller Champollion, when speaking of the great desert of Sahara, in northern Africa, where he had traced the source of former rivers and streams, and had found stumps of trees covered by several feet of sand, makes the following remark: "And so, the astounding truth dawns upon us, that this desert may once have been a region of groves and fountains, and the abode of happy millions." * * * He asks, "Is there any crime against Nature which draws down a more terrible curse than that of stripping Mother Earth of her sylvan covering? The hand of man has produced this desert, and I believe, every other desert on the surface of the earth. Earth was Eden once, and our misery is the punishment for our sins against the world of plants. The burning sun of the Desert is the angel with the flaming sword who stands between us and Paradise."

The countries bordering on the Mediterranean, on all its sides, were once well-wooded, fertile, fruitful regions, sustaining a dense population. With the centuries came the undue destruction of the forests, and the consequent loss of fertility, followed by diminished population. Look at the famous regions to the eastward, Palestine the land of groves, the land that flowed with milk and honey; see the adjoining regions, now marked by the mighty ruins of Palmyra and the cities of the plain. Beyond these, see the broad fields of Persia, whence Alexander drew his mighty armies, and observe the once fertile valleys of the Tigris and the Euphrates where stood the luxurious Babylon, the great but fallen; all these once populous regions are now deserted, and literally become the habitation of bats and owls, in fulfilment of prophecy, clearly traceable to the destruction of the forests.

Even in our own favoured land, here in this new world, these scars upon the face of nature already begin to appear, and in some places on the Atlantic border tracts of farming land are already turned out as unproductive wastes.

Yes! verily, my friends, it is indeed time that we were thoroughly aroused to the importance of this matter of the conservation of our forests. We should plant shade-trees and groves, shelter belts and woods; yes, and where suitable conditions exist, we should also plant extensive forests for the sake of their future prospective, but certain, benefit to ourselves, and to those who are to come after us. Why will we not learn from the experience of past ages, which is everywhere expressed so plainly in the history of nations, and *impressed* so manifestly in the *desert scars* of the earth?

Let us take warning betimes and begin now, and at once undertake *the preservation of our forests.*

Forests are the conservators of moisture, the sources of the streams. The tree is father to the rain, was a favourite saying of Mahomet.

Then again we must remember that time is needed for the production of a tree. The Botanists call them *perennial* plants, because they continue their existence *through* the years. Vegetables of this class do not build up their massy structures, composed of con-

centric layers of solid fibre-cells, with the rapidity of the fungi, some of which will evolve millions of their cells in a few hours, visibly enlarging while we behold.

Nor can the trees be compared in their periods of growth, and the quickness of their cash returns, with the familiar tillage crops of the agriculturist. The weeks and months needed for the production and perfecting of garden and farm crops, are represented by the decades and centuries of years required for clothing the denuded surface with forest growths of mature and useful size. It is, therefore, high time to begin the work.

Be not discouraged, however. Trees grow fast enough. One of the classic writers of the age, who fully appreciated trees, put his own sentiments into the mouth of one of his rustic characters when he wrote, "Be aye sticking in a tree, Jock, it will be growing the whiles ye are sleeping."

Those of us who are now past middle life, no doubt many of you now present, can point to noble trees which have grown within your own recollection; some of them, perhaps, were planted by your own hands. Strange as it may be, however, it seems nevertheless true, that old men, those who cannot expect to see, nor to reap, the fruits of their labours in forestry, are the most energetic tree planters, rather than those just entering upon life with a bright future opening up to them decades of prospective enjoyment, and with a reasonable expectation of life even comparable to the term necessary for the development of a useful tree. Old men are proverbially the tree planters everywhere.

In regard to their periods of development, there is a great diversity among trees; some have a brief rotation. The coppice growths in European forestry are often utilized in periods of ten or fifteen years; in our own country too, we have many trees of short rotation, and some of the most useful and most profitable trees are of this character.

The *Black Locust* may be harvested after it has grown from twenty to thirty years.

The *Catalpa speciosa*, in the same period, will make good cross-ties and fence posts.

The *Ailanthus* very soon attains a useful size, and for certain purposes has been very highly commended, both in this country and in Europe. Prof. C. S. Sargent is advising its extensive plantation, and some years ago it was spoken of as the most promising tree for the arid plains of the southwest.

The forests of *Scotch Pine* in Germany are allowed sixty years to reach their useful size for fuel and for timbers.

The *Birch* there reaches its maturity in about half a century.

The *Willow*, used for charcoal needed in the manufacture of gunpowder, may be cut after growing twenty years or even less.

Chestnut, in its second growth, is most profitably cut every twenty or twenty-five years.

The beautiful wood of the wild cherry soon reaches a profitable size for many purposes, though for sawlogs and lumber the trees should be larger.

Many individual trees, planted by the pioneers upon the broad plains of Nebraska, within the few years that white men have occupied the so-called "American Desert," have already attained to useful size, and will yield each a cord of firewood to cheer their owners. While the census reports represent the extent of woodlands in Ohio as covering about one-third of its total area, which is a full ratio for lands situated like ours, we are not informed as to its condition. The skilful forester, however, cannot fail to observe that these tracts are very far from being in a condition to yield the best results either economically, or in their influence on the climate and water courses of the adjacent regions, and he finds them much less satisfactory in regard to their own improvement and perpetuation by succession.

Nearly all our woodlands have been culled severely, robbed of their most valuable products and specie; they are rarely in a condition for natural reproduction. In many cases they have been carefully cleared up; aye, cleared up by the removal of their undergrowth, both of bushes and of young forest trees, and they are even deprived of nature's own favourite carpeting, composed of the fallen spray, the leaves, the logs, with the mosses and lichens that feed upon these decaying tissues. All these make up an admirable mulching material that prevents evaporation, and which receives and retains the fallen rain, which quietly sinks into the mellow soil beneath, but which, when falling upon the bared surface of cleared lands, quickly escapes in rushing and destructive tor-

rents. Some very neat and would-be careful and economical farmers, after thus clearing up their woodlands, attempt to render them profitable by laying them down to grass, and then use their woods as pasture fields; very beautiful they are considered by the poet, but not by the forester, who sees in all this but the garnished tomb of the trees.

Yes, my friends, the time has indeed arrived when we, as a people possessing a full share of common sense, ought to realize the absolute necessity for devoting a portion of our energies and intelligence to the conservation and care of our sylvan treasures, and this will be followed by planting anew the waste tracts, and untillable hillsides and corners, or rocky ledges, with suitable trees.

We should plant forest trees for ornament to the landscape.

We should plant them for shelter to our crops, our cattle and ourselves.

Trees should be planted to guard against the failure of the water supply of the country.

Woods should be preserved for their influence in regulating the temperature and humidity of the atmosphere, for it is established by long continued observations made at the forestal stations of Europe, that the woods *are cooler in summer and warmer in winter*, and that they contain more moisture when compared with tracts of open lands in the same regions.

Finally, we should plant forests, were it even for their use and for the valuable products which they yield for our consumption in the multifarious demands of civilized life.

In all this we are forced to acknowledge our ignorance as to the best means of beginning this new industry, this new and important branch of agriculture. We are brought to a stand by the grave question of

How to Do it.

The Rev. Frederick Starr, of St. Louis, in a very excellent article presenting the urgent need for the preservation of our forests, which appeared in the U. S. Agricultural Report for 1866, appeals for Government aid, in lands and appropriations, to support and carry on suitable nurseries and forest plantations for the common good, as exemplars of such a character as no private individual can afford.

More recently, some of yourselves, joined by hundreds of earnest men in very many of the States, memorialized Congress to send a suitable and well informed Commissioner to Europe to gather up important and valuable information that should be adapted to our conditions and wants, which might enable us to emulate in our own country the perfected plans of their admirable systematic forestry management. Though urgently and persistently presented to the Senate and House committees, those bodies could not be persuaded to report upon the bills and memorials laid before them.

It may well be asked, why should not this important subject be referred to those great institutions founded upon the Government land grants for the endowment of Agricultural and Mechanical Colleges? This has already been urged, and a few of them are paying some attention to forestry and tree planting.

Some of you now present may recollect that a similar convention of Agriculturists, assembled in this chamber in 1872, did me the honour to listen to a set of resolutions begging the managers of our own Agricultural College to take the preliminary steps toward the teaching of forestry, by beginning the establishment of an *arboretum*, upon a part of their extensive grounds here at the Capital of Ohio, where, eventually, all the woody plants possible to the soil might be grown, and ever open to the inspection of the students and of interested visitors.

Even at this late date, I feel impelled to record the gratifying circumstance that the Convention of 1872 did itself credit by heartily endorsing the offered resolutions—and to acknowledge that the effort of that day, though barren in tangible or visible results upon the broad acres of the college farm, was not absolutely a case of wasted effort in the cause, nor of *love's labour lost*.

There is now undoubtedly a more encouraging outlook for the patriotic statesman in this direction as manifested in the increased interest felt by many in the subject of forestry. This is seen in the daily and agricultural press, and in the fact that the topic

under discussion should have been put upon the programme for this meeting. And, my good friends, let me also add, in the marked attention and apparent interest you have shown in this imperfect response to the question before us, and to which query is rendered the decided affirmative response:

Yes! yes, truly and most emphatically, the time has fully come when we, the people of Ohio, should plant trees for timber.

REPORT OF THE COMMITTEE APPOINTED BY THE FRUIT GROWERS' ASSOCIATION OF ONTARIO TO AID IN DIRECTING THE HORTICULTURAL DEPARTMENT OF THE SCHOOL OF AGRICULTURE, AT GUELPH.

To the Honourable the Commissioner of Agriculture :—

Sir,—The Committee appointed, at your request, by the Directors of the Fruit Growers' Association, for the purpose of assisting in carrying out your wishes in reference to more extended operations in Horticulture and Forestry at the institution in Guelph, beg to report as follows :—

That after the consultation, in reference to the work to be undertaken, which the Committee had with you on the 18th of March last, at the farm, we at once entered upon the du ies assigned us. Our first step was to ascertain what had already been done in this direction, and, on taking an inventory of the fruit trees on the grounds, it was found that the orchards were very deficient in size, and that a considerable number of our most popular and desirable fruits were not represented in the collection. After mature deliberation your Committee resolved to begin the planting of an orchard which should contain all the popular varieties of fruit, and in such quantities as would be amply sufficient to supply the tables of the institution and give the students an opportunity of becoming familiar with the appearance and quality of the different sorts, and to which should be added from time to time such other varieties as might be thought desirable.

Orchard.

Under the advice of Prof. Brown we selected a field of twenty acres for a permanent orchard, in which it was decided to plant the apple trees in rows twenty-five feet apart, with a tree in the centre of each square, the pear, plum, and cherry trees twenty feet apart each way, the spaces between the trees to be planted, while the trees are young, with small fruits. As the funds available for the purposes of this Committee were small, we were obliged to limit the planting for this season to about five acres. A shelter belt was planted along the northerly and westerly sides, consisting of Norway spruce, Horse chestnut and European linden. Desirable fruits were then selected to the following extent: 49 varieties of apple, 23 varieties of pear, 13 varieties of plum, 10 of cherry, 9 of grapes, and 5 of raspberries.

Forestry.

An arboretum was begun which it is intended shall eventually comprise all the trees and shrubs likely to prove hardy in this Province, and 32 species of deciduous trees, 18 of evergreens and 46 of shrubs were planted. A large number of the newer ornamental shrubs were introduced into the borders and other portions of the grounds.

In forestry, a beginning was also made, and about half an acre of young trees of the black walnut and the same quantity of trees of the European larch were planted.

The success attending these efforts has been on the whole, thus far, satisfactory ; the fruit trees, vines and shrubs having made a fair growth. In the forestry department the black walnuts have made a promising start, and are likely to make a good growth during the coming season. The European larch, in consequence of unusual drouth after planting, and the late period at which they were received, have been a failure, a very large proportion having died. We hope, however, to be able to renew these during the coming season, under more favourable circumstances.

Nursery.

A nursery department has also been commenced, and some seeds supplied with the view of raising young forest trees and shrubs for further planting. Since the autumn is a much more favourable time for planting these seeds than the spring, we deemed it unwise to do much in this department at a time of the year when the chances of success were doubtful. We are now taking steps to secure seeds of many of our forest trees for more extensive planting this fall. We regard this department as one of very great importance, from an educational stand point, since it will afford the students an opportunity of becoming acquainted with the growth from its earliest stages. It will also be the means of supplying the establishment, in the most economical manner, with a large number of young trees for future forest and ornamental planting.

Future Operations.

During the coming season, your Committee purpose completing the planting of the orchard of twenty acres of fruit trees, and to plant, also, two acres of grapes, an acre of strawberries, and two or three acres to include raspberries, currants, gooseberries, and other small fruits, which will, when completed, lay the foundation for an abundant supply of fruit for all the purposes of the school.

It is also our intention to add largely to the arboretum, where every specimen is being carefully labelled, under the direction of Prof. Brown, with the common and botanical names, for the convenience of visitors as well as the instruction of pupils.

The ornamental department will also receive attention ; a number of new flowering shrubs will be procured, and likewise a selection of hardy, perennial plants.

In forestry, a more extended work is also to be undertaken. Your Committee propose to plant, during the coming spring, half an acre each of sugar maple, hickory and butternut, a quarter acre each of white ash, English ash and white oak, some sweet chestnut, and half an acre or more of a mixture of American elm, black walnut, pine, wild cherry and ash.

It has been a source of great satisfaction to your Committee, that in carrying out the works we have undertaken, we have been ably and cordially assisted by the Principal of the School (President Mills), the Professor of Agriculture (Professor Brown), and the head gardener (Mr. Forsyth).

We beg again to call your attention to the necessity that exists of the appointment of a Professor of Horticulture, whose special duty it shall be to instruct the students in all matters relating to fruit growing, horticulture and forestry. It cannot be expected that this important branch of instruction can receive the consideration it is entitled to as long as it occupies a subordinate place among the duties of a Professor whose time is already fully occupied in superintending the agricultural and stock departments of the farm. In the interests of the school we would urge that this deficiency be supplied at the earliest possible opportunity.

All of which is respectfully submitted.

Wm. Saunders.
Chas. Arnold.
D. W. Beadle.

List of Fruit Trees, etc., Planted under the Direction of the Committee in 1880.

The following are the varieties planted and growing, with the number of specimens of each variety :-

The Apples are,

10 Golden Russet.	10 Grimes' Golden Pippin.
2 Rhode Island Greening.	2 Ontario.
6 Roxbury Russet.	6 Pomme Grise.

Apples,—*continued.*

2 Hawthornden.
2 Ella.
2 Yellow Bellflower.
6 Ben Davis.
2 Blenheim Orange.
2 Twenty Ounce.
2 Rambo.
2 Chenango.
2 Alexander.
2 Dora.
6 Swayzie Pomme Grise.
2 St. Lawrence.
1 Montreal Beauty Crab.
1 Transcendent Crab.
1 Vanwyck Crab.
2 Early Harvest.
6 Duchess of Oldenburg.
2 Pomme Royal.
6 Baldwin.
6 Wagener.
4 Spitzenburg.
2 Fameuse.
2 Lady Apple.
2 King of Tompkins County.
2 Swaar.
2 Beauty.
2 Maiden's Blush.
2 Wealthy.
12 Talman Sweet.
2 Mother.
2 Pewaukee.
2 Beauty of Kent.
2 Fall Pippin.
4 Lady Sweet.
2 Cox's Orange Pippin.
2 Ribston Pippin.
2 Gravenstein.
2 Keswick Codlin.
1 Hyslop Crab.
1 Marengo Crab.
2 Summer Rose.
4 Benoni.
4 Red Astrachan.

The Pears are,

2 Tyson.
4 Sheldon.
6 Beurre d'Anjou.
6 Winter Nelis.
4 Seckel.
2 Dana's Hovey.
1 Mount Vernon.
5 Bartlett.
6 Flemish Beauty.
2 Summer Francreal.
4 Negley.
6 Clapp's Favourite.
2 White Doyenne.
2 Gray Doyenne.
5 Lawrence.
2 Duchess d'Angouleme.
4 Goodale.
2 Souvenir du Congress.
2 Vicar of Winkfield.
2 Osband's Summer.
2 Belle Lucrative.
2 Louis Bonne de Jersey.
2 Rostiezer.

The Plums are,

9 Lombard.
2 Damson.
2 Webster Gage.
1 Duane's Purple.
1 Bradshaw.
2 Royal Hative.
2 Columbia.
2 Diamond.
2 Jefferson.
4 Pond's Seedling.
4 Glass Plum.
2 Goliath.
2 Reine Claude.

The Cherries are,

2 Elton.
2 Black Heart.
2 Olivet.
1 Downer's Late Red.
2 Black Eagle.
2 Governor Wood.
3 May Duke.

THE GRAPES ARE,

18 Concord.
4 Salem.
4 Brant.
5 Agawam.
2 Massasoit.
4 Martha.
5 Canada.
5 Creveling.
4 Wilder.

THE RASPBERRIES ARE,

155 Philadelphia.
20 Herstine.
37 Dorchester.
67 Mammouth Cluster.
42 Clark.
33 Highland Hardy.

LIST OF ORNAMENTAL TREES AND SHRUBS PLANTED IN ARBORETUM, 1880.

Acer dasycarpum laciniatum.
" platanus.
Æsculus Hippocastanum.
Alnus glutinosa.
Amygdalis nana, fl. pleno.
" " white.
Betula lenta.
" alba pendula.
" pendula lacinata.
Gleditschia triacanthos.
Cornus Florida.
Juglans cinerea.
" nigra.
Gymnocladus Canadensis.
Koelreuteria paniculata.
Lirodendron tulipifera.
Magnolia acuminata.
Pyrus aucuparia.
Prunus triloba.
Philadelphus coronarius.
" nivalis.
" Zeyherii.
Spirea prunifolia.
" opulifolia.
" Thunbergii.
Salix caprea pendula.
Salisburia adiantifolia.
Syringa Josikæa.
Tilia Europæa
Weigela hortensis.
" arborea.
" rosea.
" variegata.

EVERGREENS.

Abies excelsa.
" Canadensis.
" nigra.
" alba.
Picea balsamea.
Pinus Austriaca.
" pumileo.
Retinispora plumosa.
" pisifera.
Thuja, Parson's dwarf.
Biota orientalis.
Thuja, Rollissin's Golden.
" Siberica.
Taxus Canadensis.

FOREST PLANTING AND PRESERVATION.

(From the proceedings of the Western New York Horticultural Society.)

By Henry E. Hooker.

The subject of planting trees for timber, and the growth and preservation of woods, to meet the wants of the future, may seem to some outside the business of our Society, or at least premature, considering how cheap lumber is at present, and how long it takes to grow saleable timber; but I believe a cooler consideration of the aspects of the case, and the discussion of it here, will show that it is not too soon to look into it, nor too early to try some moderate experiments.

In this matter our neighbours, both east and west of us, are moving faster than we are, and have already secured valuable experience and present profit, by somewhat extensive plantings.

The western nurserymen have grown large quantities of seedling forest trees, which have been sold for timber plantations in prairie sections, and even shipped some of their largest orders to the eastern States, where the proportion of timbered land is greater than it is here in western New York. They waked up to the fact that the systematic growth of such wood as is most needed now, and will soon be greatly in demand, will be *profitable*, much more so than the hap-hazard, spontaneous growths of mixed wild woods.

As an encouragement to this undertaking, consider the immense increase in the manufacturing industries which are dependent upon a supply of good timber for their success; and how great must be the call for lumber if our nation continues its present prosperity; compare this demand with the rapid disappearance of the forests, and some idea may be formed of the probable *profit* of tree planting.

Thirty years, or even less time, with proper management, would furnish us forests capable of supplying the most desirable varieties, sizes and qualities of timber. The growth of trees here is so much more rapid than it is in France, Germany or England, that it is safe to say we can reach a size and quality in thirty years which they need fifty years to produce. Europeans do not think it unreasonable to plant trees for use fifty or eighty years after planting. Cannot we undertake a crop only thirty years in maturing, which will also be a source of comfort and income after ten or fifteen years?

We are called now to undertake works in all departments of industry, which are to be pursued at a more temperate pace than formerly, and to be satisfied with results which would once have seemed inadequate compensation.

Farmers upon the prairies, who have had to contend with winds and storms, which came to them over vast areas not broken by timbered lands, and who have suffered the loss of crops, buildings, stock and valuable lives from this cause, are impressed with the fact that they must have screens and fruit protection before they can be comfortable or safe. Their efforts will, I doubt not, be crowned with success, and we *may see*, before many years, that they surpass us in the possession of valuable timber, as far as they now excel us in the growing of abundant grain crops. They have sharply suffered from hail storms and hurricanes, coming over their treeless regions, and been parched and frozen by winds which should have been moderated by passing through wooded sections, until they are ready for the work and cost necessary to protect themselves and their children.

It may also well happen, that they will secure favourable results not expected, in the steadier flow of their streams, and a larger average rainfall, for while not perhaps indisputably *proven*, there is much to confirm the belief, that large bodies of trees do sensibly increase the condensation of moisture and promote seasonable rains.

Farming in western New York, upon the newly cleared lands, and with favourable markets, has formerly been fairly remunerative, and may still be considered so, on good, well conducted farms of moderate size, whose proprietors are labourious and do not look for much interest upon the capital invested in land. We have now arrived at a place where it is plainly to be seen that *labour* and the capital invested in buildings, stock, tools and manures are about all that can be looked upon as productive, the large outlay required for these items renders it impracticable to use all the land of an average farm to advantage. This leads us to inquire seriously whether timber growing is not the use to which a portion of each farm should be put.

I think I am within bounds when I say that one-fifth to one-tenth of each farm of one hundred acres in western New York could safely be withdrawn from farm crops or pasture without reducing the annual income of the proprietor one cent, the farmer generally having more land than he has capital to use to advantage. If this portion can be cheaply brought into growing valuable, well located and well protected timber, it ought to be undertaken immediately.

Individual Effort.

The American form of government deprives the rulers of some of the powers and opportunities possessed by some of the foreign ones, and transfers the duty to the citizens.

Among these duties is the care of the forests. The care and preservation of forests is one of the serious duties of European governments and landlords; trained foresters are employed and careful supervision exercised over the woods. Here small power is left with the rulers to preserve in their beauty and usefulness the treasures of timber which the land strives to produce; the people must save the forests if they are saved at all.

We, then, being made aware of our duty, must exert ourselves and see if by the less conspicuous labours of the many we may not secure a larger and more perfect result in forestry than could be obtained by a despotic government. We are certainly in for the trial. It remains to be seen whether we shall prove equal to our opportunity. If we do our duty fully, the benefits will be greater and better distributed than under any other form of working. I know there will be a feeling with some that this is a work for Government, railways, large land-owners and corporations, but it is an error to suppose they can do it as well or as perfectly as it can be done in smaller quantities.

Preservation of Soil and Streams.

The preservation and planting of forests is now demonstrated to be a *necessity*, if we would save the soil for future generations. The history of other countries shows conclusively that if a land is for a long time robbed of all its forests it must become a desert, and unfit for human habitation. If the sun, wind and rain have complete possession, in due time the power of the soil to sustain man is lost. Trees play too important a part in the economy of nature to be exterminated without incalculable evils upon those who are so ignorant or imprudent as to do it.

If great areas are deprived of all the trees, the streams and springs must be unsteady in their flow, and at times dry up altogether, because the waters held back by leaves and shaded soil are given up too easily and suddenly to keep up continuous supplies. The deposits of leaves which forests grow and accumulate, cease to gather; the cold of winter penetrates deeply and severely into the wind swept earth; roots are frozen hard and killed, which a slight mulch of leaves would protect; various species of half hardy plants disappear; vegetables of all kinds grow spare. Man himself is unable to retain control of useful crops, and a treeless land becomes in due time a desert, even in a temperate climate and with a good soil.

In the old prophet Nehemiah's time, "Asaph had charge of the king's forests," and it was necessary, in reconstructing the Lord's house, to secure an order on him to "get timber for beams," so carefully did the Persian monarch guard the woods. Now, the Garden of Eden, stripped of its trees, has become a striking example of the truth of what I have said. Asia minor and the countries bordering the Mediterranean, once the most fertile portion of the whole earth, and supporting a population more dense than any modern country, are now poor and becoming yearly poorer, mainly through the one great mistake in failing to preserve a due proportion of forest growth, and increasing too largely the land devoted to pasturage, growing bread-stuffs, plants for the loom, and injurious articles of luxury, like tobacco and opium. Truly "man cannot live by bread alone."

Spain has suffered severely in this loss of trees. A recent writer in the *North American* says: "During the reign of Abul Hassan the forests of the Sierra Nevada were protected by stringent legislation, and in every district where the original woods had disappeared, the proportion of orchards and grain fields were no longer optional, but regulated by a code of "field laws." After the conquest of Granada these laws were abrogated, and the Moorish orchards and chestnut groves disappeared to make room for Christian vineyards. The Moslem inhabitants, who were hunted out of Europe like wild beasts, had created a paradise in southern Spain, but their Christian conquerors could not prevent that country from becoming a desert."

Sanitary.

Much has been said and written as to the sanitary effects upon the whole country of the extensive removal of the forests, and it is not to be questioned that these effects must be very considerable, but not easily arrived at. We seem to be most interested in making

our farms and homes healthy, trusting that the general welfare will be promoted alone with our individual good.

Every country house can be made more comfortable and healthy by so disposing a goodly number of evergreen and deciduous forest trees as to break the force of prevailing winds, without smothering it and closing completely the free circulation of air. This can also be accomplished without shading the buildings. Plenty of sunshine and plenty of air are quite consistent with each other, and with due protection from hurtful winds. Extremes are to be avoided, and in the judicious use of forest trees, we have the true protection from torrid heat and arctic cold, both of which are sure to visit us in this climate.

The destruction of a grove of trees is sometimes fatal to the comfort of a residence, and again the removal of trees is imperatively necessary before a house shaded by large ones is fit for a habitation. The folly of raising a grove of trees over our houses is equal to that of the men who cleared off *all* those within half a mile of home.

Beauty.

In the preservation and care of our spontaneous growths, and in making plantations of evergreen and other trees, a little timely attention to appearance will do much towards securing permanent beauty. Nature strives to clothe herself in beauty. The outskirts of all woodlands, if undisturbed for a few years, become handsomely furnished with various forms and colours. The mixed wild woods of some of our hillsides and river banks, where oak and pine, maple and hemlock, ash and spruce, chestnut and sassafras, mingle their several shapes, and contrasting colours, could scarcely be improved in beauty by the interfering hand of man ; but in other localities, the addition of a considerable number of species, not spontaneous, there would be both an additional charm and a large source of profit to the planter. Not unfrequently the sorts most needed for beautiful effects would be the ones most successful in growth. I do not expect practical farmers to plant largely for beauty, but no sensible man need to forget it either in clearing or planting. The beauty of a place is often the most considerable item of its market value.

Spontaneous Growth.

The careful preservation of the native growth of trees which are found here, and which are so often destroyed before they come to any useful size, should be one of our first cares. These woods will be for many years our chief reliance, and all we shall be able to do in planting must be a mere supplementary matter, mainly directed at furnishing a sufficient quantity of those desirable species and varieties of trees which are readily exterminated by cutting, and which do not replace themselves by sprouting from the roots, such as all the evergreen trees.

We have still many tracts of hilly, broken, swampy or rocky lands, upon which are growing mixed lots of young forest trees, as valuable as any we should be able at present to plant there. Let these be carefully thinned, so as to save for large growth such specimens as will become of considerable value in due time. Prune their bodies of side branches while small, that the stem may grow up clear and free from knots. Space them off with care, so that the better trees may have a healthy and full development, not too much room, but enough to keep them in rapid growth upward as well as with sufficient strength of trunk to bear the strain of winds. Keep the forest thick at bottom along the outside boundaries, and exclude all animals, and such woods will soon be in good condition for profitable growth.

Western New York has a soil and climate very favourable to the production of a large variety of deciduous and evergreen trees of the best description for timber. This whole country has been once cleared of a dense forest, much of which was burned up to get rid of it and secure the soil for the growth of farm crops. This was then a wise course, indeed the only thing to be done under the circumstances, and the men who did it were efficient in the work, but they were human, and went too far. They cleared too much land, more than we can now cultivate to advantage. Possibly they have only provided a way for us to secure a new growth of trees finer than the original forest, and far

better adapted to the use of intelligent American citizens, and which will not need to be burned up, but worked up into all manner of useful and beautiful articles, if we can but fill our opportunity as well as they did theirs. Every generation has its work. Ours seems to be to render beautiful, profitable and comfortable the lands which they made habitable and productive. They were labourious and thoughtful of their children; shall we be less so because we are not so hard pressed for subsistence? They needed fields from which to produce food and clothing. It did not and could not occur to them that the demand for grain, and for butter, cheese, meat and wool would one day induce their children to so destroy the sheltering forests that even the fields would become useless because there were no woods, and the clear, steady streams turn to muddy, destructive, temporary torrents because there were few leaves and limbs. The farmers who wanted more land from which to make money out of farming, have proved an enemy to trees ten times more to be feared than the lumbermen who selected the larger and useful trees for their purposes, leaving the young trees to grow and fill their places. The lumberman is a good friend to the forest, when compared with the farmer, who clears up, root and branch, a thriving wood, and secures an unproductive field, where man sweats in vain and beasts fail to thrive.

Farmers are the men who have laid low our noble forests, and they should be the first to enter upon their due restoration. Their haste to grow rich, rather than their real necessities, has hastened their own troubles (as this spirit often operates), and now the excess of their field and pasture land calls loudly upon them for speedy and wise reformation. Farmers unwisely disturbed the tree balance of forest and field, shelter and sunshine; they must restore the equilibrium. Speedy repentance will be profitable as well as honourable.

Plantations of Forest Trees.

The work of forming a forest by planting out trees has a serious look to begin with, and the cost, time required for maturing the crop, uncertainties as to results, etc., may well cause us to look carefully before we go deeply into it; but many of its difficulties disappear before investigation, and after consultation with those who have tried it. There are great difficulties in the way of obtaining reliable facts in regard to expense, rapidity of growth, value of the crop, best varieties and species for planting, etc. This compels me to treat this part of my subject in too general and indefinite a manner to satisfy the practical men who compose this Society. The experience of foreign planters is not reliable (although abundant), either as to cost, time, best species, or value of crop. We have to rely mainly upon the result of nursery experience, observation of growth of trees here, and the knowledge we possess as to the finest trees, known to be valuable for marketing. With such a basis, we can reach an approximate estimate of cost, and select such varieties, and pursue such a course of management as will give us, I doubt not, a sound foundation for starting the work, and time will enable us to improve our methods and our selections. Doubtless the man who has good white ash, chestnut, cherry, oak, white pine or maple to sell twenty years hence will find it worth something.

It may be feared by some that a supply of best young plants is not to be had at low rates. This is true in part now, but would not be true long, in regard to all the best species, if planting were to go on in earnest. It would not be necessary to go beyond the members of this Society to find men competent and willing to supply all the plants required, at low rates, as soon as a reliable market is found. Foreign nurserymen keep large stocks of seedling forest trees, which can be imported safely and at moderate prices; and planters who wish can secure young plants from neighbouring forests, or sow seed and grow sorts to best advantage in that way. For instance, oak, black walnut, hickory, and perhaps chestnut, can be as well grown where wanted, without transplanting, as in any other manner. Planters who will take the pains can also secure specially fine stock by saving their own seed from trees which have an individual as well as a race superiority, for it is a noticeable fact that there are considerable variations in the size, thrift and excellence of the timber among trees of the same species. These points would soon be learned, as well as how to plant and prune, by an intelligent young man. Once interested

in this matter, abundant fields of thought, observation, labour, and profit would open up, and cheap supplies of young trees become abundant.

Locating Plantations.

An important point in forest tree planting is the fact that much additional comfort and beauty can soon be secured by planting in such a manner as to protect the exposed highways, buildings, orchards, stock and fields from prevailing winds, while we are supplementing our native growths with such rare and desirable evergreen or deciduous trees as we may lack, or deem most likely to prove profitable. A belt of evergreen trees forty or fifty feet wide will thoroughly accomplish this protection and give a beautiful face to the plantation. A belt or plantation of trees, ten years planted, would be an ornament and a security against winds which nothing else can equal. Lands of small value for any other purpose can be found upon many farms, where, by a judicious selection of species, excellent crops might be grown of trees not indigenous there. Evergreens often grow superbly where no evergreens were found in the old forest. Chestnut, oak, maple and ash will thrive where other species originally prevailed. In this judicious selection of species for a particular location must lie one of the most important and difficult matters to be decided, and in this, local experience will always be of paramount value. Every planter must decide for himself after securing such information as he can reach.

Best Species for Planting.

It would be a task quite beyond the reasonable limits of this paper to describe the best species of forest trees for plantations, and to give the best methods for growing them, several of the most valuable are native and abundant here, and well known to all of us. I need only to call your attention to the following as among those which I esteem eminently worthy of extensive trial, and easily procured viz. :

White ash, chestnut, black walnut, hickory, oak, cherry, elm, maple, locust, white pine, Austrian pine, Scotch pine, Norway spruce, European larch ; also poplar, willow, ailanthus and catalpa for some special uses.

Facts of great interest and value in regard to the whole subject of forestry can be found in numerous foreign works, in the reports of our kindred societies, and in some few American authors. Also from the report of the U. S. Commissioner of Agriculture. But so new is the topic with us that we must depend mainly upon local experience and observation. My limited experience and reading will not justify me in offering you much advice, nor in giving figures which can be considered trustworthy, beyond an approximation, which may not prove wide of the mark, and likely to be below rather than above the good results to be expected, where good land is used and where rapid progress is secured by good culture and protection.

Time does not allow me to enter into the details of planting or culture, but the following hints may be of value :

Plant mainly our best native trees, and depend only upon them.

Plant in the spring, as soon as the ground can be worked easily.

Plant transplanted or nursery-grown trees, where they can be had at reasonable prices.

Plant evergreens a little later than deciduous trees, and never expose the roots to the sun or wind.

Cultivate carefully the first three years (just as you would corn or potatoes), with cultivator and hoe. After that the trees will need little cultivation of the soil.

Prune annually, either in the summer, after the first growth is over, or in the fall ; never in April, May, or June. Keep the pruning attended to, so as never to have to cut a limb more than one inch in diameter, larger ones are liable to make a defect in the timber. Prune close to the stem and the scar will heal in one season.

Never allow stock to enter the plantation.

Keep the outside of the plantation close and dense at bottom, with a good number of evergreens, which should form a considerable share of all plantations. This is neces-

sary to secure a good mulching of leaves and to keep the winds from injuring both the soil and the tall trees. Large plantations will prove better than hedgerows, or very narrow belts or detached trees.

Estimated Cost per Acre of Forest Trees.

1st year—3,000 seedling, ash, elm, chestnut, cherry, larch, pine or spruce plants, at $5	$15 00
Planting, cultivating and care, 1st year, (plants set 4 ft. by 4 ft.)	10 00
2nd, 3rd and 4th years—Hoeing, cultivating and pruning, etc., $5 per acre	15 00
5th year—Plantation established and interest on stock and labour charged up	10 00
Cost of established plantation per acre	$50 00
Fifteenth year. (After ten years more the trees will become useful and saleable.)	
Fifteen years' use of land, $3 per acre	$45 00
Ten years' use of capital	50 00
Cost of forest per acre, fifteen years old	$145 00

Crop Estimate.

2,000 trees 3 to 8 inches in diameter, and 15 to 25 feet high, at 5 cents each	$100 00
500 trees left, 8 feet apart each way, to grow to larger size, 20 cents each	100 00
	$200 00

This result, I think, could be reached by using land of average fertility, and by the expenditure in cultivation named. A smaller outlay in cultivating and pruning, and the use of cheaper lands, would reduce the cost, but I think the percentage of profit would scarcely be greater. If this return is not very tempting, it is at least not an unwise use to make of some of the lands now even less productive, and considering all the advantages to be derived, I think the work well worth undertaking in western New York.

Railways and Forests.

An important item in the question of forests is the use made by the great railways of timber for sleepers, and the construction of cars, buildings, etc., and their protection from snow. Prof. Sargent says: "The amount of timber required to replace the ties once in seven years, on the 85,000 miles of track in the United States, is 34,000,000 sleepers annually, equal to thirty years' growth on 68,000 acres of the best natural woodland." These companies must, before long, be compelled to pay good prices for the timber needed along their lines.

Railway Protection.

The destruction of the forests along the line of the railways has led to serious evils in the way of delays, danger, and accidents to the trains, causing loss of life and destruction of property through the drifting of snows common in our northern climate. A forcible illustration of this fact has just occurred near by us, and within six miles of Rochester.

Friday, January 4th, 1879, a special train drawn by six powerful locomotives and preceded by a gigantic snow plough, endeavoured to force its way through the snow banks

east of here. This train was wrecked by a bank of snow drifted into a cut not over twelve or fifteen feet deep, but so hard and solid was this snow and sand, accumulated from the adjoining open fields, that it proved sufficient to wreck four of the locomotives, destroy the lives of a brave engineer and his fireman, and cripple for life a valuable officer of the road, and delay the whole business of this great road four days. Nothing of this kind could have happened if such spots had been well sheltered by forests, for snow drifts are impossible in dense timber. This accident (along with others equally preventable) detained the passenger and freight operations of the New York Central road four days, at a loss to them in wreckage, extra labour and loss of business, equal to at least $200,000. It would cost the company $150 per acre to buy the land, plant in forest and care for it five years; at the end of five years the serious drifting would be stopped, and after ten years protection would be perfect; in fifteen years land so planted would commence to furnish useful timber and sleepers. From that time onward the protection could be maintained, and a steady increase secured from the forest, which would make the investment one of the best the company possess, for timber alone. The single storm of January 4th and 5th cost the company enough to buy land and plant 1,300 acres of forest, which, if set in a belt four rods wide, would extend (162 miles) over all the worst points between Albany and Buffalo, the embankments needing no such protection.

A belt of trees four rods wide might be made as follows, setting the plants four feet apart each way:

1st. Four rows on the windward side, of Austrian or Scotch pine. 2nd. Two rows of Norway spruce or white pine. 3rd. Four rows of chestnut. 4th. Four rows of white ash or wild cherry. 5th. Two rows of Norway spruce or American arbor vitæ outside to make the bottom dense.

Such a plantation as this would completely protect the road from drifting snow, and cost but a small sum compared with its immediate benefits, while the ultimate result would be largely profitable in the crop of timber, if judiciously managed. It seems as if want of information upon this subject must be the only reason why men so sagacious as the managers of this road have not entered upon this work vigorously, because there are several points at which much money has been expended inefficiently in building expensive fences to protect the road from snow banks.

A well planted belt of forest trees, as above described, costing $150 per acre, could be grown for 150 miles in length for less than this one single delay and extra expense.

NEW AND RARE FRUITS FOR 1878.

By Wm. C. Barry.

The year 1878 has been rendered memorable in the annals of American pomology by reason of the large number of new native fruits which have been originated or introduced during that time. The list of peaches especially has been wonderfully augmented. Descriptions of about thirty seedlings, never before described, have come to our notice, and we may safely estimate that as many more have fruited, but have not as yet been made known to the public. In connection with this remarkable array of peach novelties, their places of origin are interesting. The State of New York offers several candidates for popular favour which appear unusually promising. From the great metropolis even come two new varieties which apparently possess many valuable qualities. In western New York, there are several seedlings which will undoubtedly prove very desirable. One of them is believed to be the largest and earliest of all the very early peaches. In the neighbouring State of Ohio, several excellent early and late varieties have originated. Passing over a vast extent of country we find a large number of new kinds in Missouri, Kansas and Nebraska, and a correspondent of the *Gardeners' Monthly*, writing from Kansas, says that "the whole list of early peaches known to the public, so far as fruited in Kansas this year, is surpassed both in earliness and size by at least fifty new seedlings of Kansas origin, many of which have borne their first fruit this year." At the south,

too, some promising new sorts are spoken of. Thus, as if by magic, the same year, and in various portions of the country, new peaches have sprung up in such numbers as to astonish and almost perplex the fruit culturist. Of the progress made and the success achieved no more convincing proof could be desired than the fact that on the 19th of July, 1878, we had upon our table large, ripe, luscious peaches, grown in the open air in the vicinity of Rochester. This is indeed a remarkable fact, and indicates wonderful progress. Our Society and all similar organizations are to be congratulated upon the successful issue of their efforts in creating and fostering a taste for the beautiful and useful in nature, and the extraordinary improvements effected in the past should encourage renewed efforts and greater exertions in the future. It is to be regretted, however, that while we must in justice award great credit to the originators of valuable new fruits for the energy, zeal and industry displayed in the production of the same, it becomes our duty to criticise severely those who would offer to the public, knowingly, a new fruit of inferior quality, or intentionally disseminate an old or discarded variety under a new name. Too much carelessness has been evinced in this regard in the past, and it seems to me that this is a proper time for this Society to consider the matter, and to adopt some measures to remedy this evil.

A List of the New Peaches of 1878.

In the following list I have endeavoured, so far as possible, to include all of the new peaches which have been noticed during the year. I am aware that this list is far from being complete, but I trust that the information herein afforded will enable those who are interested to prosecute their inquiries with greater facility the coming season. Nearly all are such descriptions as I have received, some few have been described from personal observation.

Beckwith's Early—Raised by Mr. Beckwith, Olathe, Kansas, in 1877. It is a clingstone peach, large, showy, firm, and it is thought will make a fine market variety. Ripened at Olathe June 20th, 1878.

Wyandotte Chief—Originated by George Krop, Wyandotte Kansas. It is large, handsome and a clingstone. Ripened June 22nd, 1878, at Wyandotte.

Bledsoe's Early Cling—Ira L. Wood, of Pleasant Hill, Mo., is the originator of this seedling. It is claimed to be five days earlier than the Amsden, in the same locality, and of better quality.

Seedling No. 1—Raised by James A. Storm, Mo. A very handsome free-stone, measuring eight inches in circumference. The originator says it possesses more fine qualities than any peach he has seen, and that it is at least ten or fifteen days earlier than the Amsden, and superior in size, colour, flavour, and durability.

Seedling No. 2—Raised by the originator of the above. This variety is said to ripen about the same time as the Amsden, is eight inches in circumference and the flavour is good.

Brice's Early June—Dr. S. M. Brice, of Kansas, is the originator of this variety, which fruited for the first time in 1874, and ripened on the 20th of June of that year. Frost and grasshoppers prevented any further fruitage until 1877, when it ripened again from the 20th to the 25th of June. In 1878 it ripened June 18th. Dr. Brice says that in a test in 1877 with the Amsden, Alexander, Early Louise, Early Rivers, and several others of the earliest and best varieties known, Brice's Early June proved its superiority in size, flavour, beauty, and early maturity.

Hynes's Surprise—Originated by E. F. Hynes, West Plains, Mo., 1877: said to be large, highly coloured, very fragrant, a prolific bearer and a good keeper. Ripened in 1877 June 28th, in 1878 June 14th.

Hape's Early—A Georgia seedling, raised by Dr. Samuel Hape, of Atlanta. It is said to equal if not surpass any early peach now known, in flavour, size, hardiness, capacity for shipping, and beauty.

Ashby—Discovered in Texas among a lot of seedlings in 1877. It is said to be a large, handsome peach, with firm flesh, of excellent quality, and ripens about ten days before the Amsden.

Baker's Early May—A seedling which made its first appearance in 1872 in Texas; resembles Hale's Early. It is a free-stone and its originator claims that it ripens six to ten days before the Amsden.

Seedlings Nos. 1, 2, 3, 4, 5, from Ohio, fruited for the first time in 1878.

No. 1 is a handsome peach, of about the size of Hape's Early, measuring seven inches in circumference, colour creamy white, nearly covered with dark purplish red, adheres to the stone; said to be two weeks earlier than any other variety.

No. 2—Similar to No. 1, but ripens a week later.

No. 3—Large, measuring eight inches in circumference and weighing 5½ oz.; skin creamy white, streaked and mottled with light red, deepening into dark crimson, flesh juicy, sweet, vinous and of first quality; ripe in August.

No. 4—Yellow and red, flesh yellow, small; ripens in September.

No. 5—A white peach, of medium size; late.

Bower's Early—Raised in Frederick, Md., in 1876. It is a freestone, of good size, measuring nine inches in circumference, and considered earlier than the Amsden.

Seedling—Originated in Rochester, N.Y. A fine peach, of medium size, round, with a dark red cheek; of excellent quality; ripe September 4th, 1878.

Seedling—Another Rochester seedling. Large, handsome, white fleshed peach, of first-rate quality; skin creamy white tinted with pale rose; matured September 4th, 1878.

Seedling—From New Brighton, Staten Island. Another large, round peach, with pale creamy white skin, flesh free, white to the stone, like Morris' White.

Seedling—Raised in New York. Very large, measuring nine inches around; skin yellowish white, flesh white, red at the stone, and a cling like Heath Cling. A splendid peach; ripe October 5th, 1878.

Gov. Garland.—Raised in Arkansas, and said to be the largest and best very early peach.

Harper's Early.—Originated in Missouri. The originators claim that it is the earliest of all peaches.

Waterloo.—The first very early peach ever raised in western New York. It was originated in Waterloo, by Mr. Henry Lisk, and fruited for the first time in 1877, when it ripened several days earlier than the Alexander or Amsden. In 1878 the first specimen ripened July 14th, and all the fruit was gathered July 19th, about a week in advance of the Alexander and Amsden. The fruit is medium to large size, good specimens measuring nine inches in circumference and weighing five ounces. The skin is whitish green in the shade, marbled red, deepening into dark purple crimson in the sun. Flesh greenish white with an abundance of sweet vinous juice, adheres considerably to the stone, like Hale's, Amsden, etc. It is a remarkable keeper, and will undoubtedly be of great value for distant as well as home markets.

Conkling.—Among fifty varieties which we had the pleasure of seeing in fruit the past season, I think this might be justly regarded as the most attractive of them all. The fruit is large, good specimens measuring 9¼ and 9½ inches in circumference, and weighing 6½ and 6¾ ounces. Skin beautiful golden yellow, very juicy, vinous and of very good quality. It succeeds Crawford's Early. This is another western New York peach, having been raised in the town of Parma, N.Y., and fruited for the first time in 1873.

Kinnaman's Seedling.—Originated with Samuel Kinnaman, of Delaware, ripened 20th June, 1878. Fruit of medium size, roundish, skin pale brownish red on a pale greenish ground, flesh greenish white to the stone, juicy sweet and of very good flavour. Adheres partially to the pit. It is said to be some days earlier than the Alexander or Amsden.

Burns' Peach.—Raised by Thomas F. Burns, Mount Palaski, Ill., who claims that it is the earliest peach known, being a month earlier than the Alexander.

Thompson's Orange.—Raised at Wilson, N.C., and said to be one of the earliest yellow peaches. It has a beautiful colour, somewhat like a yellow apricot, is a free-stone and has a good sub-acid flavour.

Sallie Worrell.—Was found on the ground of Mrs. Worrell, near Wilson, N.C. It is regarded by good judges as the finest flavoured peach in the Carolinas.

Callie Scaff Peach. A seedling of Early York raised in Water Valley, Ky., said to be earlier and better than Amsden.

The above list comprises thirty varieties all more or less new. How many of them will prove real acquisitions it is impossible to predict. We intend to watch them closely the coming season, and trust at our next annual meeting to be able to furnish much valuable information about them. Our notes on this subject would hardly be complete without a few remarks on the newer peaches which have been tested the past season.

Alexander's Early and *Amsden's June*, in which a great deal of interest has been manifested, have proved so nearly identical as to make it impossible to distinguish one from the other. They are the largest and earliest of the very early sorts, not taking into consideration the introductions of 1878, of which the "Waterloo" is thought to be nearly a week earlier. The time of ripening of the newer sorts has also been satisfactorily determined. Alexander, Amsden, Honeywell and High's Early Canada bear such a striking resemblance to each other as to be considered almost identical, and all ripen at about the same time. Then follow in the order named, Brigg's Red May, Early Beatrice, Early Louise, Early Rivers, Rivers' Early York, Early Silver, Magdala, Dr. Hogg, etc.

Rivers' Seedling Peaches.—Of these Rivers' Early is now recognized as one of the finest peaches, and particularly deserving the attention of the amateur. Its delicious flavour places it at once at the head of the list. For distant markets, however, it is doubtful whether it will be of value, as both skin and flesh are tender, and it will, therefore, not bear much handling, (This remark may apply to all of Mr. Rivers' seedlings.) Another handsome and excellent peach is the

Early Silver, which, although introduced at about the same time as Beatrice, Louise, and Rivers, has not been widely disseminated, and therefore is comparatively unknown. The fruit is large, larger than the Rivers, of a beautiful silvery colour, flesh melting rich, vinous and white to the stone, like Morris' White. It ripens about the 1st of September, and is well worth the attention of fruit-growers.

Large Early Mignonne is another which bids fair to rank high in popular estimation so soon as known. It is large, skin of a pale, straw colour, marbled with red, flesh melting and very good. This fine peach was raised from the Belle Beauce, and ripens latter part of August.

Dr. Hogg is a handsome free stone, of medium side, skin pale white with crimson cheek, flesh with red around the stone, and very good.

Early Albert is a clingstone, of medium size, skin white, mostly covered with light red, flesh white, melting and very juicy.

Crimson Galande is a large peach, free-stone, flesh tender, melting, rich and of a delicious flavour; ripens in the latter part of August, and should never be omitted in a collection for the garden.

Magdala.—Of medium size, colour, creamy white, marbled and blotched with crimson, flavour quite original, being a combination of peach and nectarine.

Princess of Wales. Very large and one of the most beautiful of peaches; colour creamy white, with a rosy cheek, melting rich and excellent; is justly entitled to be numbered among the best.

River's Early York is of a medium size, skin marbled with red, flesh melting and juicy; ripens after Early Rivers.

Several choice peaches, about which there seems to be little known, may be named as follows.

Belle de la Croix.—A large variety, remarkable for its rich, sweet flavour.

Belle Beauce—large and handsome, skin pale white, with crimson cheek and marbled with light red; flesh white, red near the stone, free, melting and of first quality.

Belle Doue.—Medium, or rather small; flesh white, red at stone and very good.

Royal George.—Large, melting and delicious.

Walburton Admirable.—Large, skin creamy white, with delicate marbling of red around base; flesh greenish white to the stone, free, juicy, sweet, delicious; ripe, end of September. One of the finest late varieties.

Royal Kensington.—Of medium size and the finest quality.

Malta.—A fine peach, though rather small.

Belle de la Croix, Royal George, Royal Kensington and *Early Rivers* are peaches of the highest flavour, and cannot fail to satisfy the most delicate tastes.

Among the older sorts raised in this country, Atlanta, of the style of Hales, and one of Dr. Sylvester's Seedlings, is a delicious fruit and ought to be extensively cultivated. Foster is another which should not be overlooked. It resembles Crawford's Early, but is superior in texture and flavour. Cooledge's Favourite, although rather small, is a fine peach, and deserves to be better known.

New Apples.

But few really new apples have been brought to notice the past year. Of the Russian apples which we have had under trial for some time, several have given evidence of value, and while they can hardly be compared in quality to our best apples, still they are fair, and will undoubtedly prove valuable in those localities where only hardy varieties succeed. The following are worthy of particular notice :

(*Season of ripening, August and September.*)

Titouka or Titus Apple.—A large, handsome fruit, resembling Twenty-Ounce. Skin smooth, greenish yellow, striped and splashed with red ; flesh a little coarse, sub-acid ; ripens, middle to last of August. This is the largest and showiest of the newer Russian varieties which we have thus far tested.

Arabskoe (Arabian apple).—Another beautiful fruit of medium size, roundish oblate form, with dark red skin, covered with a rich purple bloom ; flesh white and juicy.

Belborodooskoe.—Of medium to large size, rather flat, tapering slightly to stalk, skin yellowish green, with light dots and a browny tint on sunny side : flesh a little coarse, juicy, sub-acid. A good apple.

Groskoe Selenke Gruner.—Of medium size, roundish conical form, skin smooth yellowish green, colour of Sweet Bough ; ripens early in August. Promises to be one of the most valuable.

Ostrowskoe.—Of medium size, round, regular, skin smooth, greenish yellow, with red cheek, and covered with white dots. Very distinct and handsome.

Repka.—Size medium ; roundish oblate form, regular and smooth ; skin pale straw colour, transparent ; flesh fine grained, crisp, juicy, sub-acid, good ; ripe early in August ; tree a free grower and very prolific. For this variety we predict great popularity.

Roschdestwenskoe, or Christ Birth Apple.—Large, roundish, stalk short, stout ; skin green, mostly covered with purplish red. A handsome apple.

Tschernoe Drewo.—Of medium to large size, roundish ; skin yellow, with a beautifully mottled red cheek. Very attractive.

Waskaroe.—Size medium, roundish, slightly conical ; skin yellow, striped and marbled with crimson, about the colour of Duchess of Oldenburg ; flesh crisp ; ripens in August.

Grand Duke Constantine.—Although we have had this variety in our collection for several years, we have not as yet had an opportunity to test it entirely to our satisfaction, owing to the imperfect condition of the fruit when examined. The conclusion we came to, however, was that it would prove identical with the well-known Alexander. The following description is Mr. Scott's, the celebrated English pomologist, and we quote it because, if correct, this variety deserves to be placed in the front rank among the Russian varieties. Mr. Scott says : "This is a noble fruit, in size and appearance. It is, perhaps, as handsome and beautiful as any existing variety, not excepting Alexander and Northern Spy. It is of the largest size, roundish, somewhat flattened ; skin clear, bright yellow, almost entirely covered with streaks of dark crimson on the side exposed to the sun ; flesh white tender, juicy, sweet, slightly sub-acid ; ripens in August.

Grand Sultan.—Another variety represented to be of first size and quality ; skin whitish yellow, covered with a beautiful bloom and striped and shaded with red on the sunny side ; flesh white, and, when ripe, transparent. A very fine fruit ; rich and juicy ; ripens in August and September.

New Pears.

The year has not been prolific in new pears. An American variety, one of the Messrs. Clapp's seedlings, has been introduced, and gives promise of great excellence. It is called the

Frederick Clapp or Clapp's No. 22.—We are indebted to the Hon. Marshall P. Wilder for the following description: "Form generally obovate, but somewhat variable, size above medium; skin thin, smooth and fair, clear, lemon yellow: flesh fine grained, very juicy and melting; flavour sprightly acidulous, rich and aromatic: season October 15th to November 1st, remaining sound at core to the last; quality *very good* to *best*, and will be highly esteemed by those who like acidulous pears. It has been exhibited for many years by the originators, Messrs. F. & L. Clapp, of Dorchester, Mass. Of this pear the Committee of the Massachusetts Horticultural Society have reported favourably for years. Of its quality they state in 1873: "It was pronounced decidedly superior to Beurre Superfin, and is regarded by all who have seen it as the highest bred and most refined of all the many seedlings shown by Messrs. Clapp." It is probably a cross between Beurre Superfin and Urbaniste, the tree resembling in habit the latter variety, and may safely be commended as worthy of trial by all cultivators of the pear."

Kieffer's Hybrid Pear is another novelty, raised from the Chinese sand pear, crossed with a cultivated variety supposed to be Bartlett. The fruit is large and very uniform in size; skin greenish yellow; flesh white, buttery, juicy; quality good. It ripens in October, when pears are scarce and high. The tree is a strong grower, and is claimed to be blight proof.

Champion Quince.

Champion Quince.—A new variety, which originated in Georgetown, Conn., in 1865 It is described as being superior to all other varieties now known. The fruit is said to be larger than the Orange, fair, smooth and of fine quality, and a late keeper. Tree bears large crops, early and regularly. We will look toward this variety with a great deal of interest.

New Strawberries.

During the past few years a large number of varieties have been introduced to public notice and are now offered for sale. For the purpose of reference, I have prepared the following list, which is still incomplete. The name of the variety is given first, then the name of the originator and date of introduction. As a record it will be found convenient and useful. I am indebted to Mr. Wm. Parry, of Cinnaminson, N.J., for information regarding the origin of several varieties:

Belle, Moore, Mass., 1876; Black Defiance; Caroline, Moore, Mass, 1876; Centennial, Durand, N.J., 1876; Crescent Seedling, Parmelee, Conn., 1870; Champion, Reisig & Hexamer, N.Y., 1872; Capt. Jack, S. Miller, Mo., 1874; Continental, Felton, N.J., 1876; Damask Beauty; Duncan, Lucas, N.J., 1875; Duchesse, Hexamer, N.Y., 1874; Cumberland Triumph, Miller, Pa., 1874; Essex Beauty, Durand, N.J.; Forest Rose, Fetters, Ohio, 1877; Gen. Sherman, Moore, Mass., 1877; Great American, Durand, N.J., 1875; Golden Defiance, Miller, Pa., 1874; Gertrude, Miller, Mo., 1873; Hervey Davis, Moore, Mass., 1878; Kerr's Late Prolific, Kerr, N.Y., 1875; Matilda, Tillson, N.Y., 1873; Miner's Great Prolific, Miner, N.J., 1877; Maud Miller, Miller, Mo., 1873; Mary Stewart, Miller, Mo., 1873; Monarch of the West, Brady, Ills., 1871; New Dominion, Biggar, Ont., 1873; Panic, Peck, N.Y.; Pres. Lincoln, Smith, N.Y., 1875; Photo, Crawford, Ohio, 1876; Pioneer, Durand, N.Y.; Patuxent, Washington, D.C., 1876; Rappahannock, Washington, D.C., 1876; Springdale, Miller, Pa., 1874; Success, White, Mass., 1876; Susquehanna, Washington, D.C., 1876; Seneca Chief, Merrill & Son., Mich., 1874; Seth Boyden, Jr., Crawford, Ohio, 1876; Sharpless, Sharpless, Pa., 1877; Turner, ——, N.J., 1872.

What portion of these varieties will prove worthy of general cultivation, it is as yet difficult to say. Another season's trial, we hope, will enable us to give more definite and

reliable information concerning many of them. Of the large number of kinds which we have personally examined and tested the past summer, the Sharpless claims the first place. It first gave evidence of value in Mr. Barry's private garden in 1877, Mr. Sharpless, having kindly sent a few plants for testing. At the last annual meeting of this Society your President referred to the Sharpless as very promising. This was the first public mention made of it. In June last, we had ample opportunity to give it a thorough trial, and it pleased us exceedingly. Its vigorous habit of growth is one of its distinguishing characteristics. No other variety that we are acquainted with produces such strong, thrifty plants, or has such large and handsome foliage. It is very productive and yields immense crops, even under ordinary treatment. The trusses are remarkably strong and well-proportioned for the burden they are intended to support, although in many cases the fruit is so large as to bend them to the ground. The berries average large to very large, are generally oblong in shape, narrowing to the apex, but sometimes irregular and flattened. The colour is a clear light red, with smooth shining surface. The flesh is moderately firm, with a fine aroma, and may be rated as first in quality. A bed of this variety, when the plants are loaded with fruit is well-worth visiting. The rich, dark green foliage at once arrests attention, even from a distance, and if we will take the trouble to approach and examine the fruit, it will not be possible to repress our surprise and admiration. If it proves as great a success generally as at Rochester, Catawissa, and Cinnaminson, we predict for it great popularity.

Among the other varieties Cumberland Triumph promises to be an acquisition for the the garden. Crescent Seedling is becoming a general favourite, and bids fair soon to be recognized as a standard variety.

New Grapes.

Rochester and Monroe, offered for sale for the first time the past year, have been received with great favour on all sides. Moore's Early, Burnet, Prentiss, Pocklington, Amber Queen, Early Dawn, Lady Washington, Highland, Duchesse and Niagara are now on trial, and we hope to be able to report favourably upon them at the next meeting.

New Raspberries.

Gregg.—During the season we were the recipients of several boxes of fruit of this new raspberry. Judging from the samples, we would not hesitate to pronounce it a decided improvement on the older varieties of Black Caps.

Reliance and Early Prolific gave us their first crop of fruit the past summer. Both varieties appear to be wonderfully productive, but the fruit is soft and hardly of first quality. They will probably be esteemed for home markets.

Pride of the Hudson, Henrietta, Cuthbert, Florence, Caroline, Queen of the Market —have not been sufficiently tested to report upon.

Wachusett Thornless Blackberries.

Although an old variety there seems to be considerable interest manifested in it. A sample was sent us during the summer, and, although three days *en route*, the fruit was in perfect order when it arrived. It seems to possess several qualities which recommend it. It ripens thoroughly, the fruit is sweet and good and less acid than any other blackberry we have seen ; the plant is very hardy, free from thorns, and said to do equally well on light and heavy soils.

NEW FRUITS IN 1879.

By Wm. C. Barry.

Referring to my report of last year on New Seedling Peaches, I suppose the question will now be asked whether any of the many varieties then enumerated and described

have proved to be acquisitions. You are, of course, aware that in so brief a period it is not possible to obtain much reliable information on matters of this character ; but it gives me great pleasure to furnish such facts as have been communicated to me, and I hope that the list may serve in some degree to avert the confusion which must necessarily arise from the introduction of so many new varities at one time.

New Peaches.

Relative to *Beckwith's Early,* which heads the list, we have nothing new to report, as the tree did not produce any fruit the past season.

Wyandotte Chief failed also to bear any fruit. Its history and description, as given in my last report, was incorrect. Mr. Kroh informs me that it originated on the farm of Mr. Matthew Mudeater, near Wyandotte, Kansas, and he describes it as a dark red free-stone, rich, juicy, and fine flavoured. Average specimens have measured eight and a half inches in circumference, and in 1878 it ripened ten days in advance of Amsden.

Bledsoe's Early Cling.—The severe winter of '78 injured the fruit buds. Mr. Wood has changed its name to "Advance," and he describes it as a delicious peach ; superior to Alexander or Amsden, and five to eight days earlier.

Respecting the Seedlings Nos. 1 and 2, raised by Jas. A. Storm, of Missouri, I have not been able to obtain any new facts.

Brice's Early June, according to reliable authority, is remarkably early, but Prof. Vandeman, of Geneva, Kansas, says that "Vandeman's Early" is destined to excel it in many particulars. As this Seedling has not been before described, I give the following description as sent to me by the Professor:

Vandeman's Early.—Originated by H. E. Vandeman, Geneva, Kansas, and named Vandeman's Early by the Kansas State Horticultural Society, bore its first crop in 1878, and ripened June 13th, the fruit measuring seven to eight inches in circumference ; colour bright purple and crimson on white ground ; flesh white, adheres slightly to the stone ; in flavour equal to Hale's. Prof. Vandeman says that he has twenty other promising seedlings. In that vicinity there are also the following seedlings, for the description of which I am indebted to Mr. Vandeman :

Nugent's June—Originated by E. J. Nugent, Ottawa, Kansas, very promising.

Town's Early—Originated by Mrs. Towns, of Garnett, Kansas, and perhaps the largest of these very early peaches.

Emporia—Originated by Mrs. L. Burns, near Emporia ; resembles the other very early kinds. Rev. S. M. Irwin, of Geneva, Kansas, has twelve seedlings, all very early.

Ashby's Early, which in my report was described as having originated in Texas, was raised by G. W. Ashby, at Charrute, Kansas, and is said to be ten days earlier than Amsden, and of better quality.

Simon Bucher, of Emporia, Kansas, is reported to have twenty kinds earlier than Amsden; and Mr. C. C. Kelsey, of Humboldt, Kansas, has some five or six seedlings that ripened ten days in advance of Amsden.

Of *Hynes' Surprise,* the Hon E. F. Hynes writes me that the late cold weather in spring injured the buds so much that there were but few peaches. He describes his several seedlings as follows: "Hynes' Surprise has fruited four years. In size it is medium to large, very highly coloured, flesh white and red, fine flavoured, and a free-stone when fully ripe. It is an excellent keeper."

Hynes' Nectar—My latest new peach is a free-stone, and delicious. In 1878 ripened five days in advance of Surprise.

Early Lydia ripens with Hale's Early. Skin rose-coloured, and a free-stone. None of these have shown any indications of rot, while the Hale's Early and Early York on the same ground rot badly.

Early Rose, a free-stone ; Gov. Phelps, a large yellow clingstone ; Howard, Gen. Custer and La Belle are all seedlings raised by him.

Hape's Early—Raised in Atlanta, Ga., and of the same season as Alexander and Amsden, is said by Mr. Berckmans to be superior to either in quality, and preferable because it is more of a free-stone.

Baker's Early May—Raised by G. W. Mosteller, Girard, Ka., did not produce any fruit in 1879.

Bowers' Early—The original tree did not bear in 1879, but a few specimens were produced on young trees; these ripened two or three days earlier than Amsden and were larger than that variety, and of finer quality. The disseminators, Messrs. Morris & Miller, say that it is so much superior to Amsden in flavour, that it would be valuable even if it did not prove any earlier.

The Rochester Seedlings may be regarded as still on trial, although one of them ripens with Crawford's Late, and resembles it so closely as not to be worthy of a distinct name. The other is quite promising.

The Very Large Seedling Peach raised in New York, ripens too late to be of value at the North, but would undoubtedly prove desirable at the South.

Gov. Garland is described as a large clingstone peach, resembling Amsden in appearance, but larger, earlier and superior in flavour. The original tree is growing six miles from Bentonville, Arkansas, but the fruit buds being injured by severe weather last winter, no fruit was obtained this season. Prof. Wm. Hudson of Tehuacana, Texas, who is experimenting with the new peaches, had a young tree which bore a single specimen that ripened five days before the Alexander.

Harper's Early, originated in Wilson Co., Ka., is, according to reliable authority resident in Kansas, not so large nor so early as Amsden.

Kinnaman's Early—Regarding this variety I have not been able to learn anything new.

Burns' Peach—I have not received any new facts relative to this variety.

The Sallie Worrell, raised in Wilson Co., N.C., is described as very large, sometimes measuring 14 inches in circumference; colour creamy white shaded with pale red; flesh juicy, vinous and very good; one of the finest peaches; ripens with Stump the World.

Bustion's October, *Harris' Winter* and *Albright's Peach* are late varieties of value at the South, but too late for cultivation at the North.

Callie Scaff is said to be a seedling of the Early York, one-third larger than Amsden, and adheres slightly to the stone, same as Hale's. In the same orchard with Amsden and Alexander it ripened in 1878 eight to ten days earlier. In '79 the fruit buds were injured by frost, hence no fruit.

The Davidson Seedlings raised in Painsville, Ohio, were carefully compared with other very early sorts by Mr. M. B. Bateham, the well-known horticulturist; and he has reported the following reports:

Seedling No. 1, ripened in 1879 two weeks later than it did in 1878. Mr. Bateham, however, believes it to be a few days earlier than Alexander or Amsden.

Seedling No. 2, which last year ('78) ripened a week later than No. 1, was not more than three days later this year ('79). Both are of fair size, brilliant colour, and equal in quality to any of this class of peaches. No. 2 ripened with Amsden and Alexander.

Mr. Bateham says that the Allen Peach, which ripened very early in 1878, matured ten days later this season ('79), and the fruit was smaller than usual. This variety was raised by A. T. Allen, of Willoughby, Ohio, and in 1878 the first ripe peach was taken from the tree on the 6th of July.

Honeywell, which was supposed to be considerably earlier than Alexander and Amsden, ripened in 1879 at the same time as these varieties, but was inferior to both in size and quality.

Briggs' Early May, which was regarded as very early, ripens with Alexander and Amsden, and is not so large nor of such good quality.

Waterloo.—In 1878 the Waterloo ripened a week before the Alexander or Amsden. In '79 the difference in time of ripening was slight, owing in a considerable measure to the overloaded condition of the tree and its unfavourable location. By actual weight and measurement we found the Waterloo to exceed in size all the very early peaches which we tested.

Wheatland is a seedling raised by D. E. Rogers, of Wheatland, N.Y. Fruit large, flesh yellow, juicy and of excellent flavour; ripens between Early and Late Crawford. Mr. Rogers, who is looked upon as one of our best peach growers, esteems this variety highly.

Wager was originated by Mr. Wager, of Miller's Corners, Ontario Co., N.Y. It is a bright yellow peach shaded with red on the sunny side; flesh juicy and sprightly, and of fair quality. Tree very hardy and productive; ripens about the same time as the Crawford.

Conkling, which is undoubtedly one of the handsomest peaches known at the North did not produce any fruit the past season.

Alpha is a seedling raised by T. V. Munson, of Dennison, Texas, and is thought to be a cross between Early Rivers and Foster. Mr. Munson says it has ripened twelve days before Alexander, and is higher coloured and firmer than Early Rivers. Among the many very early sorts this seems to be the first representative of a new type, and we sincerely hope it may prove worthy of dissemination. We have now, too many seedlings of the Hale's and our efforts should be directed towards originating peaches like the Alpha.

Mr. Munson says that the following seem to be real acquisitions for the south.

Family Favourite, originated by W. H. Locke, Bonham, Texas; a seedling of the Chinese Cling, but ripening two weeks earlier.

Bogy's Leviathan.—Raised by Mr. Bogy, of Bonham, Texas, very large; of fine quality, and ripening three weeks later than Crawford's Late.

Miss May, originated by Mr. Carroll, of Dresden, Texas, of large size, first quality and very late.

Infant Wonder.—Raised by Capt. Daniel Webster, of Dennison, Texas; very large and fine; late.

Mr. Munson, who is making a specialty of peach culture says, that according to his observations, those varieties with reniform and notched glands are the most robust and healthy. Those with globose glands rank next in vigour, while such sorts as have serrate or glandless leaves are unreliable as to time of ripening, and are disposed to rot and mildew. He has classified the following:

To the first section belong—Early Beatrice, Early Louise, Early Rivers, Brice's Early, Waterloo, and Alpha.

To the next—that is those with globose glands—Wilder, Musser, Early Canada, Alexander, Amsden, Baker's Early May, Hynes' Surprise, Hynes' Nectar, Bowers' Early.

To the last belong—Downing, Climax, Cumberland, Saunders, Honeywell, Brigg's Early May, and Early Lydia.

I am indebted to Mr. Munson for the following list of of new peaches, the names of which are now given for the first time:

Williams.—Discovered in Delaware some years ago by Lewis Williams, of Hillsboro, Md., said to be earlier and finer than Alexander.

Larkin's Early.—Raised by D. F. Larkin, Hunt's Station, Ten., is represented to be as fine as Large Early York, and ten days earlier than Alexander.

Eureka.—Disseminated by M. W. Samuels, Clinton, Ky., is said to be as good as Alexander, and earlier.

Kelley's Early.—Raised by H. M. Kelley, Irving, Ill., is said to be very large and to have ripened twenty-one days before the Amsden.

Ramsey's Early Cling.—Originated by A. M. Ramsey, Mahomet, Tex., is described as an improved Alexander.

Seedlings No. 1, 2 & 3.—Raised by Mr. Sharp, of Wooster, Ohio, are all said to excel the Alexander.

Sherfey's Early.—Raised by Raphael Sherfey, Gettysburg, Pa., who thinks it will eclipse all others.

Brown's Early.—Originated by W. L. Brown, Ashley, Ill., and is said to be very early.

Sleeper's Dwarf is the name of a dwarf variety originated by W. M. Sleeper, of Oxford, Indiana. It is described as of remarkable dwarf compact growth; the original tree having grown only three feet in eight years. Fruit of medium to large size, greenish white tinged with crimson: flesh juicy, sweet, rich; season, October. In our nursery the tree of this variety has not grown more than two inches in two years, and we have therefore rejected it from the list as unprofitable to cultivate. It is, however, a curiosity, and will be considered desirable by some as an ornamental tree.

Schumaker is a seedling originated by Michael Schumaker, of Fairview Township, Erie Co., Pa. Borne for the first time in '77. Described as large, round, bright yellow splashed with crimson, and is said to ripen three to four weeks earlier than Alexander or Amsden.

Graves' Semi-cling.—Originated by Mr. Wm. Graves, Hazelhurst, Miss.; is believed to be a hybrid of the apricot and peach. It is described as one of the largest and finest of the very early peaches, and five to six days earlier than Alexander.

Thus you see how extended has become the list of new peaches. It is to be regretted that so many sorts ripening almost at the same time, and so closely resembling each other should have been named and offered for sale. We trust that in the future no one will attempt to introduce a new peach until they are perfectly satisfied that it has superior qualities not common to any other variety. At the North, generally, and in western New York, in particular, the past season was remarkably favourable for the peach. We had ripe specimens of the Waterloo sent to us August 2nd, and on the 1st of November we gathered from our own orchard, ripe fruit of Comet, one of Mr. Rivers' Seedlings. At the West, however, the severe winter of '78–'79, and late spring frosts at the South ruined the peach crop in many localities; otherwise I should have been able to submit a much more complete and interesting report. Another favourable season will, I hope, enable us to fix definitely the value of many of these novelties, and then the list will undoubtedly be greatly reduced. I will add that the following varieties of Mr. Rivers' seedlings ripen at the same time with Mountain Rose and Crawford's Early, and being only of medium size and fair quality are hardly worth retaining. They are Dagmar, Dr. Hogg, Early Albert, Early Alfred. Early Beatrice is superseded by Alexander.

New Apples.

Novelties in this class of fruits are remarkably scarce.

Highland Beauty, a seedling apple of medium size, good quality and a long keeper has been brought to notice by Mr. E. P. Roe.

Kirkland is the name of another handsome seedling apple, resembling the Yellow Bellflower; of large size, good quality and a late keeper. Both have been described in our horticultural journals, and it is not necessary to refer to them here.

New Pears.

The "Hoosic."—Some nine or ten years ago, we received from the Hon. A. Foote, of Williamstown, Mass., several varieties of seedling pears. Among them were seedlings of Hacon's Incomparable, Seckel, Marie Louise, Washington, etc. They all possessed a certain degree of merit, but up to this time only one of them developed sufficient character and quality to be worthy of dissemination. This is a seedling of Hacon's Incomparable, which Mr. Foote first sent us as "Hacon's No. 3," and subsequently named "Hoosic." This variety we have fruited several years, and we believe that its many good qualities fully justify us in calling particular attention to it. Fruit large, obovate, having considerable exterior resemblance to Beurre Diel. Stalk 1¼ inches in length, moderately stout, and set obliquely in a slight depression; calyx large, open, in a shallow basin; skin, greenish yellow, dotted and marbled with russet; flesh fine grained, melting with a rich almond flavour like that of the Edmunds; in quality ranking as best; season, October. Tree, an erect, free grower, very hardy, and remarkably prolific.

Herr's Late Winter is the name of a new seedling pear raised by A. G. Herr, of Louisville, Ky., and brought to public attention by Messrs. Nanz and Neuner. It is described as of medium to large size, good quality and a long keeper; specimens having been kept in perfect condition until May and June of the following year.

New Cherries.

Mr. D. B. Wier, of Laeon, Ill., who has been experimenting with seedling cherries for several years, offered for the first time last autumn 45 new varieties of the Early

Richmond type. We have several of them on trial. We have also in our collection a fine seedling resembling the Elkhorn or Tradescant's Black Heart. It equals that variety in flavour and firmness of flesh, ripens a week later, and shows no disposition to decay. For home use and market it must prove valuable on account of its good quality and lateness. I cannot permit the occasion to pass without referring to the choice sorts of *Montmorency*, now in cultivation; one of them in particular deserves special mention. This variety came to us under the name of "Montmorency Longue Queue," but did not prove true. We have called it "*Montmorency Large Fruited*," as the fruit is of large size, and for one of that class of very fine quality; preferred by many to the sweet cherries.

Dyehouse Cherry, figured and described some years ago in the *American Agriculturist*, has proved to be a valuable addition to the list of hardy cherries. It was found some thirty years ago growing wild among some Morello cherries, by a Mr. Dyehouse, in Lincoln Co., Ky. The fruit is of medium size, bright scarlet, with a very small stone, and is produced in great abundance at the strawberry season. The tree is of dwarf compact growth, and very hardy, surpassing in this respect the Early Richmond.

New Plums.

I can only recall one variety which seems deserving of special notice. This is a foreign sort, not new, but quite rare, and called *Decaisne*. It is in form, size and appearance exactly like Coe's Golden Drop, but it ripens in August and promises to be very valuable.

New Grapes.

The new white grapes, *Niagara*, *Prentiss*, *Duchess* and *Pocklington* have been so frequently noticed and described that I will not occupy your time with any reference to them. We are now testing Miner's and Pringle's seedlings, which are quite numerous, and we hope to find among the number some varieties worth keeping. I have received a circular in which the *Cortland* grape is described and recommended as a remarkably early black variety. I will be obliged for any information regarding it.

New Raspberries.

Within the last few years many seedlings of the Philadelphia type have been raised. They are all hardy but of different quality, not fit to eat, but being coarse, dry texture they can be handled successfully and are therefore valuable for market. Let us hope that the new ones that are to come may prove more palatable.

The Montclair, raised by the Messrs. Williams, of Montclair, N.J., is said to be a promising new sort; hardy, productive, and of good quality.

Norwalk Seedling, disseminated by Mallory and Downs, of South Norwalk, is also said to be valuable.

Belmont is the name of a new black cap raspberry raised by Mr. John Scobs, of Barnesville, Ohio. It is described as larger than the Mammoth Cluster, more productive, and is said to ripen its main crop five to seven days later.

New Blackberries.

Warren.—Said to be very early, ripening six to eight days before the Kittatinny.

Duncan Falls.—Said to be very hardy, productive, and free from rust. Berries of a large size, good flavour, and ripens before the Kittatinny.

New Strawberries.

Crystal City, raised by E. Williams, of Crystal City, Mo., is said to be one of the earliest varieties. It is of fair size, colour bright scarlet, and of good quality. Plant vigorous, running almost as freely as the Crescent Seedling.

Marvin's Seedling was originated by H. Marvin, of Ovid, Michigan, in 1874. Berries large, roundish, conical, bright red, juicy, sub-acid. The plant is said to be very prolific, and the fruit of such a texture as to fit it for shipping; very late.

Huddleston's Favourite, a seedling of the Wilson, raised by D. Huddleton, Dunreith, Indiana, is described as larger than the Wilson, and of better quality; in short, it is said to possess all the good qualities, and none of the bad, of that berry of world-wide fame.

Success, a seedling of Jucunda, raised by N. B. White, of Norwood, Mass., is said to be large, firm, of excellent flavour, and very late; plant vigorous, hardy and very prolific.

Longfellow and *Warren*, raised by A. D. Webb, of Bowling Green, Ky., were produced from a mixed lot of seed from Seth Boyden, Black Defiance, Champion and Monarch.

Longfellow is described as very large, long; colour dark red; flesh firm, sweet, rich and of first quality; ripens early and ships well. Plant vigorous and very productive.

Warren, large and of fine flavour; colour dark red; flesh firm and of good quality. Plant vigorous, and as productive as Cumberland Triumph.

Mr. Durand sends out a new sort called *Black Giant*, said to be very large, and of good quality.

Glendale was found growing wild in Akron, Glendale county, Ohio; fruit is of large size; colour bright red, and is said to be of excellent quality when fully ripe; it ripens very late and is said to ship well. I saw a sample of the fruit last season, at Cleveland, but it seemed only to be of medium quality.

The Garden, raised by P. H. Foster, of Babylon, N.Y., is said to be a seedling of Monarch of the West. It is described as large, of fine flavour and very handsome.

Shirts is the name of a new variety raised at Shelby, Michigan, and is said to be promising.

Cetewayo, raised by A J. Caywood & Son, Marlboro, N.Y., is described as large, irregular, firm, sometimes measuring six inches in circumference. It ranks with Chas. Downing in flavour; fruit stems eight to ten inches long, foliage a foot high; quite prolific.

Mammoth Bush.—Of same origin, described as making remarkably large plants, having twenty to thirty fruit stools; foliage standing fifteen inches high, more productive than the Wilson; fruit a third larger than Wilson, uniform, and equal to Triomphe de Gand in flavour.

PRESERVING FRUIT.

There are three methods of removing the natural juices from fruit—sun drying, kiln or oven drying, and evaporating.

The method of drying in the sun is well known, kiln or oven drying is better than sun drying, as the operation is more rapid. The fruit, also, is kept from the action of flies, so numerous during the fruit season, and much less liable to be infested with worms. Many of our driers are only large ovens or kilns used to deprive the fruit of moisture by the action of heat. By this method the surface is first dried—nearly charred—while the inner portion of the fruit is soft. When pressed together, the moisture from within is absorbed by the charred surface, and when not over-charred the pieces of fruit become soft and pliant.

Evaporation is based on entirely different principles. The surface is kept moist while the entire process is going on, whether the evaporation of it is in a hot-air chamber or in melted sugar. When the evaporation of the natural juices is effected in melted sugar, the process, however, is usually called conserving.

Evaporation in a moist hot-air chamber is based upon the well-known scientific fact that a volume of air at the freezing point absorbs the one hundred and sixtieth part only of its own weight of moisture, and that every 27 additional degrees of heat doubles its absorbing power. Hence, if air at 32° Fahrenheit, the freezing point, absorbs the one hundred and sixtieth of its own weight of moisture, at 59° Fahrenheit it will absorb the one-eightieth of its own weight of moisture; and at 80° Fahrenheit, the one-fortieth; and at 113° Fahrenheit, the one-twentieth; and at 140° Fahrenheit, the one tenth; and

at 167° the one-fifth : and at 194° the two-fifths ; and at 221° Fahrenheit, the four-fifths, or nearly its own weight, while at 248° Fahrenheit, heated air will absorb one and three-fifths its own weight.

Now, put this heated body of air, charged with more than its own weight of moisture, in motion at the rate of 20 miles an hour, or 880 feet per minute, and the reason of evaporating fruit so rapidly is apparent. Every 100 cubic inches of air at 60° Fahrenheit, and 30 inches to the barometer contains about 30 grains of water ; at 212° Fahrenheit, not far from one-fourth of an ounce of water. A drier chamber of the capacity of 225 cubic feet, according to this estimate, will contain at a temperature of 212° Fahrenheit fully 60 pounds of water, 50 pounds of which has been absorbed from the heated fruit. If the circulation is sufficient to empty this chamber every thirty minutes, 150 pounds of water is abstracted and carried away from a drier (full of fruit weighing 803 pounds) every hour, or 750 pounds are carried off in five hours, about the time necessary to evaporate apples or peaches when in good condition.

It will be seen from this that heat alone is not sufficient to produce evaporation. It will not do it, however great, either on the earth or in an evaporator. Stormy winds fulfill the pleasure of the Creator quite as effectively in drying up the surface of the earth after a heavy rain as do the burning rays of the sun. The sun's heat alone on the moist earth would fill the air with a dense, damp vapour, destructive alike to the health of animals and plants. So, in the philosophic drier, the fruit is put in at the bottom of a heated air chamber, where a stream of cold air containing the fortieth part of its weight of moisture is introduced and driven through the fruit at the rate of twenty miles an hour, and out of an "escape," loaded with more than its own weight of moisture. The air in motion, more than the heat, causes the fruit to dry so rapidly ; and the rapidity of the process, and the moisture in which the fruit is enveloped, prevent oxidation or decay, and give the evaporated fruit, when not over-ripe, so much of the colour of fresh fruit. The shorter the time the fruit is in the drier, the more perfectly the oxygen is excluded, and the brighter the colour.

But the colour of the fruit, however strongly it may recommend it to consumers, is by far the least practical benefit in the process of evaporation. The nutritive value of evaporated fruit, in consequence of the chemical changes during the process, is its chief recommendation.

It is still an open question whether the rapid change of starch into grape sugar in the hot-air chamber of a philosophical evaporator may not be attended by the further change of grape into cane sugar, though no actual analysis demonstrating the fact has yet been made.

Crystals of sugar exist often in great abundance on the surface of the well preserved specimens of evaporated peaches and pears, and possibly on apples, though I have not observed it. It certainly takes much less sugar to suitably sweeten evaporated than sun or kiln dried fruit of any kind.—*San Francisco Daily Evening Bulletin, Jan. 30, 1878.*

Directions for Preparing Evaporated Fruits and Vegetables for the Table.

Apples.—For sliced apple pies, soak the apples in cold or tepid water until soft, then use the same as if they had not been dried; when baked you cannot distinguish any difference between the pie and one made *the same* from fresh apples, except that the one made from the evaporated fruit is the richer, and if properly made, contains the most nutriment ; one pound of evaporated apples will make 5½ large pies. For mince pies, fruit cake, fritters, rolypoly puddings, apple butter, etc. Soak in cold or tepid water until soft, then use same as if they had not been dried.

Peaches. Soak in cold water until soft ; sweeten to taste, the same as you would fresh fruit ; if very ripe before dried, use without cooking ; be careful not to add more water than will be required for dressing ; if you wish to have a cream dressing, use less water ; if not ripe enough before evaporated, stew them after soaking.

Pears. Soak in cold or warm water until soft, stew in the same water ; if they are sweet pears, they will require but little or no sugar.

Plums. Prepare same as pears.

Lima Beans.—Soak in cold or tepid water until they are soft; cook the same as fresh green beans in the same water, and they will be in every respect the same as fresh beans taken direct from the garden.

Sweet Corn.—Soak in three times its weight in cold water, an hour or more; boil it in the same water without washing about thirty minutes, or until it is tender; season with butter, salt and milk or cream; serve while hot.

Squash and Pumpkin Flour, for pies, custards, etc., is an excellent, delicious and healthful food, and cannot be made by any other process.

Recipe for making Pumpkin or Squash Pie.—Three heaping table-spoonfuls of the flour, with boiling water enough to dissolve it; ½ teaspoon butter; 3 tablespoonfuls of light brown sugar; 1 fresh egg; ¼ teaspoon ginger; ¼ teaspoon cinnamon, mace or nutmeg; milk enough to properly thin it; *mix well* and bake in a slow oven, if the pumpkin or squash is not ground, cook it same as dried pumpkin; stew it down and force through a cullender and use *with the above recipe* the same as you would fresh pumpkin, but cook in a *quick oven.*

STATEMENT OF THE COST AND PROFIT OF ONE SEASON'S WORKING OF ONE OF NO. 3 PACIFIC EVAPORATOR.

ALDEN, Erie Co., N.Y., Feb. 10th, 1880.

Messrs. Tiffany & Curtis:

Gents,—Yours of 2nd instant at hand, asking for statement of what we had done with the No. 3 Pacific Evaporator, bought of you last September. We append the following summary of the business done:

No. bushels apples bought	6,755
" " " shrinkage	337
" " " evaporated	6,418

Average cost of apples per bushel 17 cts.	
No. pounds made from above 382.79.	
Total received for sale of fruit	$4,598 00
Total expense for fruit, storage, handling and manufacturing	1,989 00
Leaving net profit	$2,609 00

Average number lbs. per bushel, five ninety-six one-hundreths; average cost of drying and preparing per bushel, 11c.

The skins and cores were utilized for vinegar to December 1st, after which time we dried them, and sold them for 3½c. and 4c. per lb. delivered on cars. During the time we dried them, the cores and skins paid all running expenses. Have sold vinegar to the amount of $138, and have enough on hand to make the amount reach $200 which added to the profit on apples with the cores and skins will make a total net profit for 1879 of over $2,800.

ROGERS & BUTLER,

B. S. BUTLER, *Manager.*

REPORT OF COMMITTEE OF THE FRUIT GROWERS' ASSOCIATION ON SEEDLING FRUITS SHOWN AT PROVINCIAL EXHIBITION.

Your Committee appointed to examine the seedling fruits shown at the Provincial Exhibition, beg to report as follows :—

Apples.

Prenyen.—This is a seedling from Prince Edward County, and one very much esteemed by fruit growers about Belleville. It is a medium-sized fall apple of a greenish-yellow colour, sometimes tinged with reddish; flesh close-grained, yellow, mild, sub-acid, juicy and very highly flavoured, an apple which we think deserves to be widely disseminated.

Grimsby Beauty.—One of the handsomest apples on exhibition, medium in size, well formed, whitish yellow with a brilliant red cheek. Flesh white, fine-grained, juicy, sub-acid with a pleasant flavour, maturing late in the fall. This is a fruit so very attractive in appearance that it would command a ready sale anywhere.

J. G. Ten Eyeke, of Grimsby, shows a fall seedling, a pretty apple above medium size, of a yellowish green colour, with a fine blush cheek, flesh fine-grained and sweet; a good sweet apple.

Mr. Wm. Roy, of Owen Sound, exhibits four varieties of seedling apples, one a fall dessert apple of medium size and good quality. The others are winter apples, which we suggest should be submitted for examination at the next winter meeting of our Association.

A number of other winter seedlings were on exhibition, but it was impossible to judge fairly of their quality in so immature a condition.

Mr. McCulloch, of Sault Ste. Marie has on exhibition a number of seedlings of Fameuse, raised by him at the Sault, all fall apples, several of which are very promising, and from their hardiness will, we hope, prove to be valuable additions to our list of very hardy apples, suited to the more northern districts of Ontario. We hope Mr. McCulloch will have several of the best of these propagated, so that opportunity may be afforded of testing them in other northern localities. Since none of these seedlings were either named or numbered we are unable to designate those which we esteemed most highly.

Pears.

Mr. R. M. Wanzer shows a fine fall seedling pear, above medium size, not fully ripe, but which we believe will prove to be a variety worthy of more extended cultivation. In form it resembles the Duchess d'Angouleme; flesh rather coarse, pleasantly granular, sweet, juicy, and of good flavour.

Mr. P. C. Dempsey, of Prince Edward County, exhibits a small sized fall pear, a cross between White Doyenne and Josephine des Malines, yellow in colour with a fine-grained, melting flesh and high flavour; a pear which will be highly esteemed by amateurs, but of little value for market on account of its small size.

Grapes.

Mr. Rickett's seedlings, from their size, number and handsome appearance, attracted much attention, and we shall first refer to some of these.

Secretary.—A black grape, bunch large, berry above medium size, sweet, juicy, with a melting pulp and high muscat flavour. If the foliage of this variety proves good, and the vine hardy, it will well deserve a place in the front rank among the best varieties.

Lady Washington.—A white grape, tinged with pink when fully ripe; bunch large and heavily shouldered; berry above medium size, sweet, with a melting pulp and pleasant flavour.

Naomi.—A pale amber coloured grape; a good sized bunch, slightly shouldered; berry medium sized, sweet, juicy with a melting pulp and very good slight muscat flavour.

Concord Seedling.—A very large bunch and unusually large berry, black, round, sweet, juicy, with a melting pulp and good flavour; a very promising grape.

Clinton Seedling.—Bunch a little above medium; berry, large, black, round, sweet, rich, juicy, with a delicious flavour. We regard this and Secretary as the two highest flavoured grapes we have seen in Mr. Rickett's collection.

The *Prentiss Grape.*—This new seedling white grape is exhibited by Mr. Hubbard, of Fredonia, N.Y., and is claimed to be a seedling of Isabella. The bunch is medium sized, or rather under medium; berry white, round, nearly medium in size, sweet, with a melting flesh and pleasant flavour. From the appearance of the branches shown, laden with fruit, we judge this to be a very productive variety.

Moore's Early.—A promising black grape, similar in quality, size and flavour to Concord, but claimed to be two weeks earlier.

Niagara.—A handsome grape of a greenish yellow colour. Bunch of medium size, very compact; berry above medium, oval, with a sweet, readily melting pulp and pleasant flavour, much superior to Concord and claimed to ripen earlier than that variety. Odour of Concord but much stronger. We believe this grape will prove to be a very popular market variety. The foliage exhibited with the fruit is very good, much resembling Concord but deeper lobed. The fruit also possesses good keeping qualities, and would bear shipping well.

Mr. Wm. H. Mills, of Hamilton, exhibits several seedlings, and after examining the fruit we visited the vines, so that we might better judge of their value.

Sultana.—A black grape. Bunch large and heavily shouldered; berry large, round, sweet and juicy, with a tender, meaty flesh, nearly melting; skin thick and firm; berry hangs very firmly to the stem. This grape will probably prove a valuable one for shipping, market or keeping. The foliage resembles Hartford Prolific, is thick and leathery, and was in good condition at the time of our visit, September 30th. The vine is a good bearer.

Tena.—A first class grape as to quality. Berry black, oval, about medium in size, flesh very tender and melting, with a rich muscat flavour. As to the bunch, we could give no opinion from a fragment of the last remaining bunch. The foliage resembles Delaware, and was about in the same condition as Delaware growing along side of it.

Lavega.—A red grape. Bunch and berry medium in size; berry red, juicy and sweet, with a melting pulp; skin rather thick; an abundant bearer; foliage not very good at the date of our visit.

Mr. Wm. Haskins, of Hamilton, exhibited some promising varieties, and his vines were also inspected by us.

Abysinia.—A black grape. Bunch large, berry above medium size, sweet, juicy, with a melting flesh and good flavour; said to ripen earlier than Hartford. We believe that this grape from its earliness and good quality combined, will prove a desirable acquisition, the foliage is tougher and thicker than Delaware; it is a good grower, and the wood ripens well.

Albino.—A yellowish-green grape. Bunch and berry above medium, sweet, juicy

and pleasant flavour. A promising grape, with a foliage equal to Delaware; vine ripens its wood well.

Both Messrs. Mills and Haskins have a number of other seedlings of more or less promise, but those named appeared to us to be the most valuable among them.

PEACHES.

Several handsome seedling peaches were shown, which your Committee intended to examine, but amid the pressure of many other duties they were overlooked.

WM. SAUNDERS.
P. C. DEMPSEY.

APPENDIX TO REPORT

OF THE

Commissioner of Agriculture and Arts.

APPENDIX (D).

REPORT OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO, FOR THE YEAR 1880.

APPENDIX (D).

ELEVENTH ANNUAL REPORT

OF THE

ENTOMOLOGICAL SOCIETY

OF

ONTARIO,

INCLUDING REPORTS ON SOME OF THE NOXIOUS, BENEFICIAL AND OTHER INSECTS OF THE PROVINCE OF ONTARIO.

PREPARED FOR THE HONOURABLE THE COMMISSIONER OF AGRICULTURE, BY THE OFFICERS AND MEMBERS OF THE SOCIETY.

1880.

To the Honourable the Commissioner of Agriculture:

SIR,—On this, the closing period of another year in the history of our Society, I have the honour to present you with our Annual Report. The year has been marked by an unusual freedom from any alarming invasion by insect pests, nevertheless the total loss caused by injurious insects to crops of various sorts has been considerable. In this Report is embodied illustrated papers by our members on injurious, beneficial and other insects, of such a character as will, we believe, prove instructive to the general public and increase the interest already felt in the operations of our Society.

Our monthly journal, the *Canadian Entomologist*, continues to be received with favour, both in Europe and America. Its issue has been regular; and the twelfth volume is now nearly completed. During the year our library has been materially increased, and many new illustrations of insects obtained with which to embellish our Journal and Report, and thus render our work of much greater benefit to the general public than it would otherwise be.

The accounts, duly audited, are herewith submitted, also the list of officers for the coming year.

Thanking you for the kindly interest you have always taken in the operations of our Society, and the substantial encouragement given, which has enabled us to carry on our work without embarrassment,

I have the honour to be,
Your obedient servant,
WM. E. SAUNDERS,
Secretary pro tem.

ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The annual meeting of the above Society was held, according to announcement, in the city of Hamilton, on the evening of Tuesday, the 28th of September, in the City Hall. A number of those especially interested in Entomology from various parts of the Province were present.

The Report of the Council was read and adopted; also that of the Secretary-Treasurer, which showed a satisfactory state of the finances.

ANNUAL STATEMENT OF THE SECRETARY-TREASURER OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO, SEPTEMBER, 1880.

Receipts.

Balance from 1879	$152 62
Members' fees and sale of ENTOMOLOGIST	329 94
Merchandise, pins, cork, etc.	57 01
Advertisements	26 15
Interest	14 56
Government grant	1,000 00
	$1,580 28

Disbursements.

Printing ENTOMOLOGIST	$288 00
Mailing "	19 50
Insurance	10 63
Rent	90 02
Annual vote to editor and secretary	150 00
Sundries, freight, etc.	35 27
Postage	35 16
Expenses of sending collection to Ottawa	12 85
Library	136 75
Paper for ENTOMOLOGIST	72 20
Report expenses	129 75
Engraving	141 44
Expenses of council and delegation to A. A. A. S.	61 00
Merchandise—cork	42 91
Balance	354 80
	$1,580 28

ABRAHAM PUDDICOMBE, CHARLES CHAPMAN. } *Auditors.*

REPORT OF THE COUNCIL.

The close of a decade in the history of our Society, as an incorporated institution, prompts your Council to a retrospective glance over the work accomplished. Ten years ago we were weak and feeble; our numbers were few, and a small eight-paged journal, published irregularly, sufficed to chronicle all our doings. At that time it was with us a constant struggle for existence as a Society, when a few generous hearts contributed liberally of their own private means to sustain a work prompted by public need and designed for public benefit. Through the energy of our members and the kindly aid of, at first the Provincial Agricultural Association and subsequently of the Ontario Government, we were soon enabled to emerge from this struggle and to feel that we were established on a firmer basis, with a great field for labour open before us. In this department our members have laboured heartily, looking for no reward beyond the pleasure which arises from the consciousness of doing a good work.

We may point with justifiable pride to the goodly pile of useful literature published by our Society during this period. Ten Annual Reports have been presented to the Government, which have been printed and widely disseminated as a part of the Report of the Commissioner of Agriculture for the Province of Ontario. These Reports of our Society have been full of matter of great importance to the agriculturist and the fruit-grower, since most of the insect enemies to field crops and fruits have been systematically treated of in them, and the remedies best fitted to control or destroy the pests explained. The Reports have been much sought after and have no doubt accomplished much good.

The *Canadian Entomologist*, the monthly organ of our Society, has now nearly completed its twelfth volume, the last ten of which have averaged about 250 pages octavo, nearly all original matter. In these are recorded the observations of our members on all parts of the continent on insect life in its various forms. The life histories of a large number of species have been given in detail, and a vast amount of other material of much value in promoting the interests and advancing the science of Entomology presented. Our journal is held in high esteem abroad as well as at home, and was for some years the only journal devoted exclusively to Entomology on the continent of America. During the past year the *Entomologist* has contained many very valuable papers; among those especially worthy of mention are the contributions of Mr. W. H. Edwards on the life histories of the butterflies of North America. We are pleased to learn that he is still pursuing his investigations in this department, and that he will continue to give the readers of the *Entomologist* the details of his discoveries.

Recognizing the important work our Society is doing, and with the object of further aiding our endeavours, the Ontario Government have added during the past year to our annual grant the sum of $250, which will enable us to illustrate more freely the articles to be published in our reports and in our journal, and to carry on the ordinary operations of our Society without embarrassment.

Besides the publication of the annual reports which are chiefly written for the general public in a popular style, and the *Canadian Entomologist*, which is a scientific record of work done by the members of the Society, but which also usually contains a paper written expressly for beginners in the study of the science, the Society has had prepared and issued to all its members extensive classified lists of the names of all insects in the different orders of which authentic records of their capture within the Dominion could be found. The value of these lists is very great. They are of the greatest assistance in providing the collector with the proper one, from among the many synonyms which, unluckily, such a large number of our insects possess; besides this they give the proper sequence of the different genera of which the orders are composed, and are thus exceedingly useful in arranging a collection. Moreover, they act as a record by which collectors know what has been done in the way of collecting by their predecessors, and when a new species is found it can at once be recorded; by this means many have been added to our lists.

The branches of our Society at Montreal and London continue to prosper. In Montreal, Messrs. Bowles, Lyman & Couper, have prepared and read some valuable papers on their investigations, and in London much good and useful work has been done.

The Council regret that the office of Secretary-Treasurer was left vacant in the early part of this year, owing to the removal from London of Mr. J. H. Bowman, but since his departure, and at the request of the Council, the work has been performed very efficiently by Mr. W. E. Saunders. We take pleasure in calling attention to the satisfactory condition of our funds, as shown by the statement of the Secretary-Treasurer.

Submitted on behalf of the Council.

W. E. Saunders,
See.-Treasurer pro tem.

MONTREAL BRANCH OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

SEVENTH ANNUAL REPORT OF THE COUNCIL.

At the close of the seventh year of the Society's existence, your Council beg to present their annual report. The retrospect of the year in Entomological matters, is a pleasant one. Nine meetings have been held, the attendance at which has been good, and the intercourse of the members has been both agreeable and instructive. Besides the eight papers, whose titles are hereafter given, many valuable observations on insect life have been recorded in our minutes, which will be of great assistance to us in the future.

Your Council would also notice that during the summer of last year, several enjoyable collecting excursions were participated in by the members, resulting in the discovery of several species of insects hitherto unknown in this locality. On the whole, it is with great pleasure that your Council report the Society to be satisfactorily progressing in the study of our science.

The papers read during the year are as follows :

1. "A description of the male Alypia MacCullochii, Kirby."—By Wm. Couper.
2. "Notes on a species of Cossus taken at Montreal."— By F. B. Caulfield.
3. "The milk plant, its insect parasites, red and black in colour."—By Wm. Couper.
4. "How to preserve specimens of insects."—By G. J. Bowles.
5. "On luminous insects."—By Geo. H. Bowles.
6. "Montreal Hymenoptera."—By Wm. Couper.
7. "Notes on rearing Lepidoptera."—By H. H. Lyman.
8. "Some of the insects that frequent the orchard and garden."—(Rev. F. W. Fyles). Selected by G. J. Bowles.

The study of the Hymenoptera of Montreal has been taken up by Mr. Couper, whose capacity and experience render it certain that the task will be well performed, and result in a great increase in our knowledge of that interesting order. Your Council would recommend the members to follow his example, and, during the coming season, give special attention to other divisions which hitherto we have almost neglected, namely, the Diptera, Orthoptera, Hemiptera and Neuroptera.

The following works have been added to the Society's library during the year :—

"Monograph of the Diptera of North America." Part 3, 4 plates, by H. Loew.

"New species of North America Coleoptera." Part 1, by J. L. Leconte.

"The Coleoptera of Kansas and Eastern New Mexico." 2 plates, J. L. Leconte.

"Synopsis of the Melolonthidae of the United States." J. L. Leconte.

"Catalogue of Coleoptera adjacent to the Boundary Line between the United States and Mexico." 1 plate, J. L. Leconte.

"Revision of the Buprestidae of the United States." 1 plate, J. L. Leconte.

"Report of the Entomological Society of Ontario for 1879."

"Report of the Fruit Growers' Association of Montreal, 1879."

The following were presented by the Royal University of Christiana :—

"On the Mollusca of the Arctic Regions." One large volume and two pamphlets.

"A list of Norwegian Lepidoptera taken in 1876."

The Secretary and Treasurer's cash statement is submitted herewith, and shows the finances to be in a satisfactory condition.

In conclusion, your Council would express the hope that the members will not relax their efforts during the present season, and that the result of the summer's campaign will be even more favourable than that of last year.

The whole respectfully submitted.

GEO. J. BOWLES,
President.

GEO. H. BOWLES,
Secretary.

Montreal, 17th May, 1880.

The President then delivered his annual address, for which he received the thanks of the members present.

ANNUAL ADDRESS OF THE PRESIDENT OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

GENTLEMEN,—The past season has not been very eventful in Ontario in matters relating to insect life. No unusual armies of insect enemies have devastated our crops, and our farmers and fruit growers, in spite of the few perennial foes, which are always more or less troublesome, have realized a bountiful harvest.

Early in the season cut worms were very numerous in the neighbourhood of London, more abundant than I ever remember seeing them before. They destroyed innumerable cabbage plants and other herbaceous plants and flowers; among the latter, pansies seemed to possess great attraction for them. I saw many fine plants of this flower, of the previous year's growth, eaten close to the ground, both leaves and stalks, and from about the roots of a single plant found in several instances from thirty to fifty of the nearly full-grown larvæ. Fortunately their period of activity does not last long, and before the end of June most of them were quietly sleeping in the chrysalis state.

The question of insectivorous birds, and their influence on the insect world about us, is attracting much attention, and the more the subject is discussed the more evident it becomes that very little indeed is *known* in reference to it; that our ideas as to what should guide us are largely inherited, or otherwise based on sentiment, rather than resting upon well ascertained facts. I am well aware that to plead in favour of the birds is a popular course to follow; but the true student of nature is ever seeking after truth, and whether the facts he discovers are in accord with long cherished opinions and popular fancies, or are directly opposed to them, are questions of little moment. The facts, whatever they may be, are what we want.

Insectivorous birds may be conveniently divided into three classes: First, those which take their food entirely on the wing; second, those which feed partly on the wing and partly from trees and shrubs, and on the ground; and third, those which take no food on the wing, but feed entirely either on the ground or from trees or shrubs. In the first class, besides some rare birds which we do not need to mention here, the following are found common in most parts of our Province: the swallows, *Hirundinidæ;* kingbird, *Tyrannus Carolinensis*; pewee, *Sayornis fuscus*, and nighthawk, *Chordeiles popetue*. The food of these birds consists chiefly of flies, a large proportion of which cannot be said to be either noxious or beneficial; many of them in the earlier stages of their existence live in the water, where they devour decaying vegetation, or feast on the lower and simpler forms of animal and vegetable life. The larvæ of many others are scavengers, devouring decaying or putrescent animal and vegetable matter, and hence well deserve to be classed with beneficial insects. In the same class of friendly species will rank a considerable number of others which are parasitic on the bodies of caterpillars, also the rapacious species which sustain themselves by devouring the weaker and less vigorous of their race. A few rare exceptions, of which the wheat midge and Hessian fly may be noted as examples, are very injurious to field crops, while the mosquito and black fly are universally branded as enemies to the human race. These birds also devour a few butterflies and moths, but

these, with few exceptions, are harmless. The question, then, to what extent these purely insectivorous birds are beneficial to the farmer or fruit-grower, reasonably admits of much difference of opinion, for while they do devour a few of our tormentors, they probably destroy a much larger number of beneficial insects, the main bulk of their food, however, consisting of harmless species. Doubtless they serve a purpose in maintaining a proper balance among the insect hosts, and between animal and vegetable life, but that their service in these departments is so all-important as some would urge admits of grave doubt.

The birds of the second division, namely, those which take their food partly on the wing and partly from trees and shrubs, or on the ground, are not entirely insectivorous. The remarks just made in reference to the first class will apply also to this, as far as their food is taken on the wing, but on trees or shrubs, or on the ground, they consume insects of entirely different classes, chiefly beetles and the caterpillars of moths and butterflies. The beetles admit of a similar division to that of the flies already noticed; the larger number are harmless, a large proportion of the remainder are beneficial, and a few are injurious. Most of the caterpillars of moths and butterflies are harmless, feeding in limited numbers on a great diversity of shrubs and trees of little or no economic importance. A few may be said to be beneficial, in consequence of their feeding on troublesome weeds, such as thistles, etc., while a few others are decidedly injurious. Among the common birds in this second class I would mention the yellow warbler or spider bird, *Dendroeca æstiva;* the red start, *Setophaga ruticilla;* the red-eyed, and yellow-throated vireos, *Vireo olivaceus* and *V. flavifrons;* the various species of woodpecker, *Picidæ* and the blue bird, *Sialia sialis.*

The birds comprised in the third class are only partially insectivorous. Among the common species are the cat-bird, *Galeoscoptes Carolinensis;* robin, *Turdus migratorius*, and brown thrush, *Harporhynchus rufus;* the sparrows, *Fringillidæ;* the cuckoos, *Coccidæ;* the nuthatch, *Sitta Carolinensis;* chickadee, *Parus atricapillus;* kinglets, *Sylviidæ;* meadow-lark, *Sturnella magna;* Baltimore oriole, *Icterus Baltimore*, and the wren, *Troglodytes ædon.* Besides these there are the blackbirds, *Icteridæ*, which in the spring devour more or less insect food, but feed chiefly on grain and seeds during the remainder of the year. Nearly all birds, excepting the rapacious species, feed their young on such soft food as worms, caterpillars, soft-bodied insects and fruit, and, from the time that young birds are hatched until they acquire the power of flight, a very large quantity of insect food is undoubtedly consumed; but the question of the greatest practical importance to the agriculturist is how far are the birds a help in keeping in check *injurious* insects. With the object of obtaining light on this point, I have, with the help of my son, W. E. Saunders—who has for some years paid special attention to this matter—examined the contents of the stomachs of a large number of birds, and I must frankly confess that the larger the experience gained in this direction the more I have been convinced that but comparatively little help is got from birds in keeping in subjection injurious insects.

When the cut worms were so common with us this spring that any bird with a very little effort might have had its fill of them, the contents of a number of stomachs were examined, especially those of the robin, but not a single specimen of this larva was found in any of them. It has been urged that some birds devour the larvæ of the plum curculio by picking them out of the fallen fruit, but I have failed to find any confirmation of this statement, indeed never found a curculio larva in the stomach of any bird excepting once in that of a robin, who had evidently swallowed it by accident when bolting a whole cherry. As for the robin having any claims upon the sympathies of man for the good he does, I fear that but a very slight case can be made out in his favour. Of fruit he is a thief of the worst kind, stealing early and late, from the time of strawberries until the last grapes are gathered; not content to eat entirely the fruit he attacks, but biting a piece out here and there from the finest specimens, and thus destroying a far greater quantity than would suffice to fill him to his utmost capacity. At the time of writing, flocks of the most pertinacious specimens are destroying the best of my grapes, while alongside is a patch of cabbages almost eaten up with the larvæ of the cabbage butterfly—nice, fat, smooth grubs, easily swallowed, but no such thing will Mr. Robin look at as long as good fruit can be had. His tastes are so expensive that to gratify them is to deprive the fruit-grower of a large portion of his profits, hence the sooner the robin ceases to be protected by legislation the better it will be for all lovers of fruit.

The insect world is composed of myriads of specimens which from their varied structure and habits admit of being classified into families, each distinct and usually easily recognizable to the practiced eye of the Entomologist. A large portion of this innumerable host is appointed to prey upon and devour the other portions, and thus it appears to me, that apart from any consideration of insectivorous birds, the insect world would and does, to a large extent, take care of itself, and when an injurious species increases beyond its normal limits, its natural insect enemies, having an unusual amount of material to work on, soon become sufficiently numerous to reduce the number of the injurious insect to its normal proportions again. As an illustration, take the now common cabbage butterfly, *Pieris rapæ*. This insect was in some way brought from Europe to Quebec a few years ago. From Quebec it has since spread over an immense area extending now from Alabama to the waters of Lake Superior, eastward to the Atlantic, and westward many hundreds of miles, and over all this district it has done immense damage to the cabbage crop. Throughout this area insectivorous birds of all sorts prevail; the butterfly is conspicuous, not very strong in flight, and during the day almost constantly on the wing; the larva feeds in exposed situations, is of that smooth character which birds are said to prefer, and although similar in colour to its food plant, is not difficult to detect. Here, then, is an instance where a comparatively feeble insect, particularly vulnerable to attack, has rapidly spread over a large portion of this continent, with little or no opposition from insectivorous birds. Indeed I have never yet found or known to be found a single example either of the butterfly or its larva in the stomach of any bird. In its native home in Europe it is seldom so very destructive as here, for the reason that a small four-winged fly, *Pteromalus puparum*, an insignificant looking little creature, is a parasite on the larva of this butterfly, and hunts its victims with the greatest assiduity; alighting on their backs and thrusting its slender ovipositor through the skin of the larva, it deposits a number of eggs there, which hatch into tiny grubs, and those feed upon and eventually destroy the caterpillar. By the constant efforts of this little parasite the cabbage butterfly is prevented in Europe from becoming a very serious pest. Fortunately this little friend has also been introduced here from Europe, although in what manner is not known, and is rapidly spreading, following in the wake of its prey, and where the parasite has fairly established itself, this butterfly, with its numerous progeny of green caterpillars, soon dwindles in numbers so materially as shortly to cease to be so grievous an evil. The butterfly spreads faster than its enemy and is usually several years in advance of it, but we may confidently anticipate that sooner or later this small fly will do for us what it has done for Europe—keep this troublesome insect within due limits. Many other similar examples might be given.

Further, the help of friendly parasitic insects is so much more efficient because it is in most instances discriminating. As far as is known, the little parasite referred to attacks only the larva of the cabbage butterfly, and in like manner many other parasitic species are restricted in their operations to a single species, while in other instances they are confined to a genus or a group of similar species. This is not so with insectivorous birds; they in most instances devour alike the useful and the injurious species, and the question may well be raised in many instances whether the good they do is not more than counterbalanced by the number of useful insects they devour. Recent observations on the family of thrushes, by Mr. S. A. Forbes, of Illinois, seem to show that their insect food consists largely of beetles belonging to the *Carabidæ*, a family every member of which is useful, since they, as far as is known, feed both in the larval and beetle states exclusively on other insects.

The field here open is a wide and inviting one, on which I trust some of you will enter. I have but touched upon it; as the results of more extended observations are recorded the opinions here expressed may need modifying. I desire to do justice to the birds.

During the month of August last, it was my privilege to visit the Great Manitoulin Island, also Sault Ste. Marie and the district adjoining. Although prevented by an accident from indulging in free locomotion, still I saw much that interested me. On Manitoulin Island I found many of the species of butterflies common in the more southern portions of Ontario; a few moths were also captured. On the shore of Elizabeth Bay,

near the western extremity of the island, a full-grown larva of *Attacus luna* was picked up, and on inquiry I learned that earlier in the season that beautiful moth was quite common in that neighbourhood.

In the department of Economic Entomology some items of interest were gleaned. The pea crop throughout this district is an important one, and I made a diligent search in many fields for indications of the presence of the pea bug, *Bruchus pisi*, but could find no traces of it. Satisfactory evidence was furnished me, in at least two instances, of the sowing of seed brought into the island which was badly infested by this weevil, yet I was assured that neither during the season following nor in subsequent seasons did the crop suffer from this pest. The pea crops growing in these particular localities were also examined by me. Hence it would appear that the climatic or other conditions prevailing in this district are so unfavourable to this destructive pest that it is unable to survive. Should this exemption prove permanent, the cultivation of the pea there will doubtless be rapidly extended, as there will be a large demand at good prices for seed peas from this section, since so many portions of the Province are now so overrun with the pea bug that it is difficult to get seed fit for sowing; and, for the same reason, such seed peas will be readily purchased for planting in the Western States.

For many years the district extending from Goderich to Collingwood has, in consequence of its exemption from curculio, been extremely favourable for plum culture, and here immense quantities have been grown and shipped to other parts of Canada and the United States, Goderich being for many years an important centre for the production and shipment of this fine fruit; but within a brief period this foe has invaded Goderich in such force that to grow plums successfully there, warfare must now be maintained against this pest similar to that practised in the more southern sections of the Province. This enemy has now advanced as far as Southampton, and before many years we may reasonably expect that the favoured district at present exempt, from Owen Sound to Collingwood, will be similarly invaded. Thinking that the Manitoulin Island, from its insulated position, might possibly offer in the future a fine field for this department of fruit industry, I examined carefully, whenever opportunity offered, for evidence of the presence of this insect. In the neighbourhood of Manitowaning I found two trees of Lombard, a blue plum, the name of which I could not ascertain, and two wild plums, all fruiting, but could find no traces of the work of the curculio; but on a farm in about the centre of the island, three miles from Gore Bay, I found on a wild plum tree which was fruiting in the farmer's garden a number of stung plums, and on opening one of them found the larva of the plum curculio nearly full grown. Since wild plums are found in many parts of the island, it is probable that the curculio will be found in other districts there. I saw several wild plum trees at the Sault Ste. Marie, but had no opportunity of examining the fruit satisfactorily; from what I saw I was led to believe that there was no curculio in that region. The cultivation of fruit both on the Manitoulin Island and at the Sault is so entirely in its infancy that it is difficult to form any decided opinion as to the probable future of this department of industry in those districts.

In many sections, forest fires have destroyed a considerable proportion of the original woods, leaving many of the larger trees standing scorched and dead. From these much marketable lumber could be got, were it not for the destructive work of the wood-boring beetles; these troublesome creatures have bored through the trees in every direction, and thus made the timber obtainable from them worthless for market, and useful only in the construction of barns, sheds, etc., on the property of the owners. Both of the large species of long-horned beetles, *Monohammus confusor* and *scutellatus*, appear to be abundant, the latter I think most common; some of the small wood-boring beetles belonging to the family *Scolytidæ* are also very numerous.

The cabbage butterfly, *Pieris rapæ*, has within the last two or three years spread over the whole of the area I visited, and is playing sad havoc with the cabbage crop. In Manitoulin Island I found a specimen or two of the Colorado potato beetle, and made further search among growing potatoes, but could find no more. I was informed that this beetle had been seen occasionally for several years past, but that it had not made any headway in any part of the island. Another insect was found attacking the potato vines, although not injuring them very much. I refer to a species of blistering beetle, *Epicauta*

pennsylvanica, called here the black bug. In some potato patches it was quite abundant, and the leaves were partially devoured, but nowhere did I see them in sufficient numbers to materially injure the crop. Since the larva of this insect does not feed on the plant, and the insect consumes the potato vine only while in the perfect or beetle state, no serious injury is likely to result from its presence. Its larval habits are such that if abundant one year it is almost sure to be correspondingly scarce the following season.

In the garden of Mr. J. C. Phipps, the Indian Agent of the Government at Manitowaning, I was surprised to find that the oyster-shell bark louse, which injures apple trees, was not only abundant on the apple trees, but the stems of both black and red currant bushes were also thickly clad with them to such an extent as to have killed a number of them. I had never before seen this destructive insect attack the currant, but it has been occasionally observed on currant bushes in the United States.

For several years past I have had occasion to refer to the depredations of the forest tent caterpillar, *Clisiocampa sylvatica*, which has devastated our gardens, orchards and forests; it has now happily almost disappeared, a result brought about, I have no doubt, mainly through the agency of parasitic flies, several species of which have been preying on them extensively. In some sections of the Province the rose-bug, *Macrodactylus subspinosus*, has been abundant and injurious. In East Flamboro' I am informed that they were very destructive to the sweet cherries, devouring the fruit, and that they also injured the grape crop by eating the bunches shortly after blossoming. Some grape growers have also suffered considerably from the attacks of the grape vine flea-beetle, which devours the buds just as they are swelling in the spring.

At the late meeting of the Entomological Club of the American Association for the Advancement of Science, in Boston, our Society was represented by Mr. H. H. Lyman, of Montreal, and the Rev. C. J. S. Bethune, whose able report of the important proceedings of the Club will be read with interest. It is gratifying to learn that the good work done by the Club has given it such a standing that the Association has seen fit to establish it as a permanent Sub-section, and the more important papers read will in future be published in the yearly volume of proceedings.

During the year the New York State Legislature has appointed J. A. Lintner, of Albany, N.Y., as State Entomologist. New York was the first State in the Union to look after the interests of agriculture in this direction and appoint an officer for the special purpose of reporting on noxious insects. The many reports of the late Dr. Fitch, extending over a lengthened period, are well known and much valued; his successor, Mr. Lintner, is a man peculiarly fitted for the position—a most patient and accurate observer, a skilled Entomologist; with an experience in this department of some thirty years, he brings to the task all the necessary qualifications. Seldom has there been an appointment so judiciously made, and I feel sure that great good will result from it.

Since I last addressed you a special Commission has been appointed by the Ontario Government to inquire into the agricultural resources of the country, and the progress and condition of agriculture therein, and recognizing the important and intimate connection of Entomology with agriculture, the Government has seen fit to appoint your presiding officer as one of the Commissioners. In performing the duties devolving upon me in this position I shall endeavour to give to Entomological matters, bearing on agriculture, that prominence which their importance demands.

WM. SAUNDERS.

The election of officers was then proceeded with, which resulted as follows:

President.—Wm. Saunders, London.
Vice-President.—Rev. C. J. S. Bethune, M.A., Port Hope.
Secretary-Treasurer.—E. B. Reed, London.
Librarian.—W. E. Saunders, London.
Council.—J. A. Moffat, Hamilton; James Fletcher, Ottawa; R. V. Rogers, Kingston G. J. Bowles, Montreal; J. M. Denton, London; W. H. Harrington, Ottawa; and Wm Couper, Montreal.

Editor.—Wm. Saunders.

Editing Committee.—Rev. C. J. S. Bethune, E. B. Reed, J. M. Denton.

Auditors.—Chas. Chapman, A Puddicombe.

After the routine business was concluded, Mr. Bethune offered some remarks on the moth of the cotton worm, *Aletia argillacea*. Twelve years ago he found it extremely abundant, late in the season, on ripe plums. He had not taken the insect again until this autumn, when they were found to be quite common in his garden. The opinion which had been advanced by Prof. Riley, of Washington, that the examples of the moth taken in these northern sections had flown northward from their breeding places in the south, he did not concur in, but believed that the insect must feed on some malvaceous plant in our midst, since the specimens he had captured were very perfect, and looked as if they had just escaped from the chrysalis. He referred to the fact of this insect having been found common in many of the Northern States, as well as in Canada.

Mr. Reed stated that he had taken this insect also in London.

Mr. Moffatt exhibited a number of interesting insects which had been captured by him at Long Point and at Ridgeway, among others *Papilio cresphontes*, *P. marcellus*, *P. philenor*, *Darapsa versicolor* and *Junonia cœnia*.

Mr. Denton reported the capture of *J. cœnia* and *Libythea Bachmani* at Port Stanley; also of *Thyreus Abbotii* at London.

Mr. Moffatt stated that this beautiful sphinx, *T. Abbotii*, had been comparatively common in Hamilton, and that a number of the larvæ had been reared.

Mr. Fletcher reported having captured two specimens of *Erebus odora* at Ottawa, one of them so perfect that he thought it was impossible that it could have flown for any distance, and thinks it must have bred in the neighbourhood.

Mr. Saunders referred to several other instances of the capture of this rare moth in Canada during the past few years.

Mr. Fletcher referred to the fact that during the last year there were published a number of papers on popular Entomology, and he hoped to see them continued, as he believed they were doing good service in making our valuable monthly journal more popular. Several of the members present promised to prepare papers of this character during the coming year.

Mr. Young, of Hamilton, asked for information on the best manner of preserving caterpillars, and inquired if any of the members had any experience in blowing them.

Mr. Reed stated that he had tried and failed. Mr. Fletcher had the same experience to relate, and had found that the only satisfactory method was to draw and colour them from nature.

Mr. Fletcher thought that most of our collections were deficient in specimens illustrating nature; that while we had spread specimens, we should also have them as at rest, and where possible, the larvæ, chrysalids and eggs.

Mr. Reed asked a question in reference to *Anisota rubicunda*, which he had found common on maple about London, but very hard to rear; he wished to know the experience of other collectors. Several of the members present stated that they also had found it difficult to rear them.

Mr. Young had reared a brood of them from butternut and beech, and found them to prefer beech to any other food. Mr. Bethune had also found them on beech trees.

Mr. Fletcher had found a small fly attacking beans this year; the larva had eaten the stem of the bean and bored into the root, and finally produced a small fly somewhat resembling a house fly.

Mr. Saunders had found several years ago a very similar fly, probably the same species, attacking the stems and roots of young cabbage plants. On comparing the fly with the description given in Curtis' Farm Insects of the root-eating fly, *Anthomyia radicum*, often so troublesome in Europe, he thought it probable that it was the same species. Mr. Saunders also reported the capture of *P. cresphontes* very early in spring, finding the larva nearly full grown in June, which became a chrysalis, and from which the perfect insect escaped in about a fortnight. He had also taken the full grown larva late in the fall, which had passed the winter in the chrysalis state, from which facts he drew the inference that this species is double-brooded in Canada.

Mr. Fletcher reported having found the larva of *Ceratomia quadricornis* about Ottawa, and finds it a difficult insect to rear.

Mr. Young had fed a brood of the larva of *Telea polyphemus* on black birch, on which they seemed to thrive remarkably well.

Mr. Kyle, of Dundas, stated that he had found *polyphemus* feeding on witch hazel (*Hamamelis virginica*), and *promethea* feeding on ash and lilac.

Mr. Moffatt had found *promethea* also on wild cherry, as well as on ash, sassafras and lilac.

ANNUAL MEETING OF THE LONDON BRANCH.

The Annual Meeting of the London Branch of the Entomological Society of Ontario was held on Tuesday, the 20th day of January, at eight o'clock in the evening, at the rooms of the Society; the President, Mr. J. M. Denton, in the chair.

Mr. Saunders reported on behalf of the Committee on Rooms, that new rooms could be secured very advantageously, situated in the Victoria Hall Buildings, and recommended that steps be at once taken to secure them. On motion, the report of the Committee was received and adopted.

The Annual Report of the Secretary-Treasurer was read, showing a small balance to the credit of the branch.

The election of officers followed, when the following gentlemen were elected:—

President.—J. M. Denton.

Vice-President.—A. Puddicombe.

Secretary-Treasurer.—W. E. Saunders.

Curator.—C. Chapman.

Council.—Messrs. H. B. Bock, E. B. Reed and W. Saunders.

Auditors.—J. H. Bowman and H. B. Bock.

Mr. Saunders reported the donation of two boxes of *Micro-lepidoptera* for the collection of the Society, by V. T. Chambers, Esq., of Covington, Kentucky; also two magnificent specimens of *Samia gloveri*, by A. H. Mundt, Esq., of Fairbury, Illinois.

The following additions to the library were also reported: from the Department of the Interior, Washington, "Hayden's Report on the Survey of Idaho and Wyoming," and "Prof. Riley's Report on the Silkworm."

W. E. Saunders,
Secretary-Treasurer.

ANNUAL MEETING OF THE MONTREAL BRANCH.

The Seventh Annual General Meeting of the Montreal Branch of the Entomological Society of Ontario was held on Monday, the 17th May, 1880, at the residence of the Vice-President, Mr. H. H. Lyman.

An interesting paper was read by Mr. Couper on the milk-weed (*Asclepias tuberosa*) and some of its insect frequenters. The paper drew attention to the curious fact that the colours of the different insects feeding upon this plant were, almost without exception, red and black.

The Secretary-Treasurer read his Annual Report, which showed the finances to be in a most satisfactory condition.

The election of officers then took place, resulting as follows:—

President.—G. J. Bowles.

Vice-President.—G. B. Pearson.

Secretary-Treasurer.—Geo. H. Bowles.

Curator.—F. B. Caulfield.

Council.—Messrs. H. H. Lyman, Wm. Couper and Robert Jack.

A short time was pleasantly spent in examining several cases of rare *Lepidoptera* belonging to Mr. Lyman, after which the meeting adjourned.

Geo. H. Bowles,
Secretary-Treasurer.

ANNUAL MEETING OF THE ENTOMOLOGICAL CLUB OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The annual gathering of the Entomologists of North America, in connection with the meeting of the A. A. A. S., took place this year at Boston, Mass., and was the most important that has ever been held, both as regards the largeness of the attendance, the number and value of the papers read, and also as regards the general interest taken in the proceedings. So highly indeed was it esteemed that the Standing Committee of the Association formed the Club into a Sub-section of Section B., (Zoology, Botany, etc.), and will publish its proceedings in the annual volume of transactions.

The first session was held in the lecture-room of the Museum of the Boston Society of Natural History, at two o'clock, p.m., on Tuesday, August 24th, 1880; the President, S. H. Scudder, of Cambridge, Mass., in the chair. There were over sixty persons present during this first meeting, and at least one hundred in all must have attended the various sessions of the Club. Among those present were the following Entomologists of note:—Dr. J. A. Lintner, Dr. John L. LeConte, Dr. John G. Morris, Prof. C. V. Riley, Dr. H. A. Hagen, A. R. Grote, Prof. Packard, S. S. Haldeman, B. P. Mann, Prof. C. H. Fernald, Prof. A. J. Cook, Dr. C. S. Minot, Rev. H. C. McCook, E. P. Austin, E. L. Graet, H. F. Bassett, J. D. Putnam, Dr. E. L. Mark, E. Burgess, Dr. Martin, J. G. Henderson, Prof. Morse, Dr. Hoy, O. S. Westcott and J. H. Emerton. The Entomological Society of Ontario was represented by the Rev. C. J. S. Bethune, of Port Hope, and H. H. Lyman, of Montreal.

After the meeting had been called to order, the President, Mr. Scudder, delivered the following address on "Problems in Entomology:"—

Annual Address of the President.

It is the good fortune of your President on this occasion to welcome you to his native heath, where our favourite science has been longer, more uninterruptedly, and, perhaps, more zealously cultivated than anywhere else in the new world. Here, in the last century, Peck studied the cankerworm and the slug-worm of the cherry, and, in late years, *Rhynchaenus*, *Stenocorus*, and *Cossus*—all highly destructive insects. Here lived Harris, who cultivated Entomology in its broadest sense, and whose classic treatise was the first important Government publication on injurious insects. Here, to-day, we have two Associations for our work, consisting, it will be confessed, of nearly the same individuals, and not many of them, but meeting frequently—one in Boston, the other in Cambridge. Harvard acknowledges the claims of our study in supporting not only an instructor in Entomology at its Agricultural School, but a full professor of the same in the University at large.

Harris attributed to Peck his special interest in Entomology, and his first paper, that on the salt-marsh caterpillar, appeared in the *Massachusetts Agricultural Repository* only four years after Peck's last, in the same magazine, on cherry and oak insects. How many of us have drawn our first inspirations from Harris? Yet probably not one of our local Entomologists ever saw him. The general direction of Harris' studies doubtless arose from the predilections of his instructor; and the unprecedented growth of economic Entomology in this country, where it flourishes as nowhere else, must be credited primarily to the influence of Harris' work. With every temptation which the wealth of new material about him could give, or which a very extensive correspondence with naturalists devoting themselves almost exclusively to systematic work, like Say, would naturally foster, he wisely followed the bent given his studies by his early training under Peck, and left a better example and a more generous and enduring influence.

In our own day, the spreading territory of the United States, the penetration of its wilds, and the intersection of its whole area by routes of travel, the wider distribution and greatly increased numbers of local Entomologists, as well as the demand for our natural products abroad, have set also before *us* the same temptation to study only new

forms and to cultivate descriptive work, to the neglect of the choicer, broader fields of an ever-opening science. It is this danger to which I venture briefly to call your attention to-day, not by way of disparaging the former, but rather in the hope that some of our younger members, who have not yet fallen into the ruts of work, may be induced to turn their attention to some of the more fruitful fields of diligent research.

We should not apply the term descriptive work merely to the study of the external features of insects. The great bulk of what passes for comparative anatomy, physiology and embryology, is purely descriptive, and is only to be awarded a higher grade in a scale of studies than that which deals with the external properties, when it requires a better training of the hand and eye to carry it out, and greater patience of investigation. We pass at once to a higher grade of research when we deal with comparisons or processes (which, of course, involve comparisons). All good descriptive work, indeed, is also comparative; but at the best it is so only in the narrowest sense, for only intimately allied forms are compared. In descriptive work we deal with simple facts; in comparative work we deal with their collocation. "Facts," said Agassiz, one day, "Facts are stupid things, until brought into connection with some general law."

It is to this higher plane that concerns itself with general laws that I would urge the young student to bend his steps. The way is hard; but in this lies one of its charms, for labour is its own reward. It is by patient plodding that the goal is reached: every step costs and counts; the ever-broadening field of knowledge exhilarates the spirit and intensifies the ambition; there is no such thing as satiety—study of this sort never palls.

It is hardly necessary to point out that so-called systematic work never reaches this higher grade unless it is monographic; unless it deals in a broad way with the relationship and general affinities of insects. It is not my purpose to call attention here to the needs of science in this department, as they are too patent to escape observation; but if one desires a model upon which to construct such work, one need not look further than the "Revision of the Rhynchophora," by Drs. LeConte and Horn. Rather than linger here, we prefer to pass directly to some of the obscurer fields of study.

When we compare the number of insect Embryologists in America with that of their European colleagues, the result is somewhat disheartening and discreditable; although perhaps the comparison would not be quite so disproportionate were some of our students to publish their notes. But take all that has been done upon both sides of the water, and what a meagre showing it makes. Of how many families of *Coleoptera* alone have we the embryonic history of a single species? Of two of the four families of butterflies, the fertile eggs of which are perfectly easy to obtain, nothing is known. In short, one may readily choose numbers of typical groups whose embryonic history would be a great acquisition to science. Here is a broad field. From the special range of my own studies let me recommend to any one eager for this work to choose the eggs of our common copper butterfly, which she will lay to order on sorrel, and the earlier stages of which can be obtained from the parent at two or three different times of the year; or the eggs of any of our common skippers, which deposit on grass, and which are equally easy to obtain, although only once a year. Or, if we turn to *Orthoptera*, the eggs of our common *Oecanthus*, concealed all winter in raspberry twigs, are more transparent and more easily obtained than those of any other cricket; and our knowledge of the embryology of any of the *Gryllidae* is very fragmentary, and of this particular tribe, *nil*. Better still, perhaps, would be the choice of our common walking-stick, as it belongs to a bizarre and isolated type, now known to be of very ancient ancestry, and of whose embryonic history nothing has been published. I have, indeed, a few incomplete notes upon this insect, but they relate wholly to a late period of development, and were made before the time of the microtome, when work over such coarse-shelled eggs was very difficult and unsatisfactory. The eggs may be readily procured, the insect being abundant in scrub-oak fields; the mother drops the eggs loosely on the ground, and from imprisoned specimens I have procured scores in a single season. Any one who will glance over the history of what has been done in insect embryology will be able to select a hundred examples as important and as easy to obtain as those already named, and by concentrating his work upon them will do better service than in an aimless selection of what may come to his hand.

In following the post-embryonal history of insects there is work for all. While allied forms have in general a very similar development, there are so many which are unexpectedly found to differ from one another, that every addition to our knowledge of the life histories of insects is a gain, and they are to be praised who give their close attention to this matter. Here is a field any Entomologist, even the most unskilled, may cultivate to his advantage and with the assurance that every new history he works out is a distinct addition to the science. The importance of an accumulation of facts in this field can hardly be over-estimated, and those whose opportunities for field work are good, should especially take this suggestion to heart. Nor, by any means, is the work confined to the mere collection of facts. How to account for this extraordinary diversity of life and habits among insects, and what its meaning may be, is one of the problems of the evolutionist. There are also here some especially curious inquiries, to which Sir John Lubbock and others have recently called attention, and to which, in this country, Mr. Riley has contributed by his history of *Epicauta* and other *Meloidæ*. I refer to the questions connected with so-called hypermetamorphosis in insects. In these cases there are changes of form during the larval period greater than exist between larva and pupa, or even between larva and imago, in some insects. There are also slighter changes than these which very many larvæ undergo; indeed, it may safely be asserted that the newly-hatched and the mature larvæ of all external feeders differ from each other in some important features. The differences are really great (when compared to the differences between genera of the same family at a similar time of life) in all lepidopterous larvæ, as well as in all *Orthoptera* which have come under my notice. No attempt to co-ordinate these differences, or to study their meanings, or to show the nature of their evident relationship to hypermetamorphosis has ever been attempted.

Not less inviting is the boundless region of investigation into the habits of insects and their relation to their environment. The impulse given to these studies by the rise of Darwinism, and the sudden and curious importance they have assumed in later investigations into the origin and kinship of insects, need only to be mentioned to be acknowledged at once by all of you. The variation in coloration and form exhibited by the same insect at different seasons or in different stations, "sports," the phenomena of dimorphism, and that world of differences between the sexes, bearing no direct relation to sexuality; mimicry also, phosphorescence and its relations to life, the odours of insects, the relation of anthophilous insects to the colours and fructification of flowers, the modes of communication between members of communities, the range and action of the senses,* language, commensalism—these are simply a few topics selected quite at random from hundreds which might be suggested, in each of which new observations and comparative studies are urgently demanded.

The fundamental principles of the morphology of insects were laid down by Savigny in some memorable memoirs more than sixty years ago; the contributions of no single author since that time have added so much to our knowledge, notwithstanding the aid which embryology has been able to bring. Nevertheless there remain many unsolved problems in insect morphology which by their nature are little likely to receive help from this source. Let me mention three:

The first concerns the structure of the organs of flight. The very nomenclature of the veins shows the disgraceful condition of our philosophy of these parts; the same terminology is not employed in any two of the larger sub-orders of insects; names without number have been proposed, rarely, however, by any author with a view to their applicability to any group outside that which formed his special study; and a tabular view which should illustrate them all would be a curious sight. A careful study of the main and subordinate veins, their relations to each other, to the different regions of the wing, to the supporting parts of the thorax and to the alar muscles, should be carried through the entire order of insects; by no means, either, neglecting their development in time, and possibly deriving some assistance in working our homologies by the study of their hypodermic development.

* Notice Meyer's beautiful studies on the perception of sound by the mosquito.

The second concerns the mouth parts. The general homologies of these organs were clearly and accurately enough stated by Savigny, though one may perhaps have a right to consider the last word not yet said when one recalls Saussure's recent claim to have found in *Hemimerus* a second labium. What I refer to, however, is another point: it relates to appendages of the maxillæ and the labium. Considering the labium as a soldered pair of secondary maxillæ we have at the most, on either pair of maxillæ, three appendages upon either side. These appendages, as you know, are very variously developed in different sub-orders of insects, or even in the same sub-order; and it has at least not been shown, and I question if it can be done, that the parts bearing similar names in different sub-orders are always homologous organs. Here is a study as broad and perhaps as difficult as the last.

The third is the morphological significance of monstrosities, especially of such as are termed monstrosities by excess. The literature of the subject is very scattered, and the material much more extensive than many of you may think. At present this subject is, so to speak, only one of the curiosities of Entomology, but we may be confident that it will one day show important relations to the story of life.

After all the labours of Herold, Treviranus, Lyonet, Dufour, and dozens of other such industrious and illustrious workers, is there anything important remaining to be done in the gross anatomy of insects? some of you would perhaps ask. Let the recent work of some of our own number answer, which has shown in the *Hemiptera* and *Lepidoptera* the existence of a curious pumping arrangement by which nutritious fluids are forced into the stomach. It is certainly strange that after all that has been said as to the mode in which a butterfly feeds, that no one should have dissected a specimen with sufficient care to have seen the pharyngeal sac which Mr. Burgess will soon show us. No! the field is still an open one, as the annual reviews clearly show. The curious results of Floegel's studies of the brain, the oddly-constructed sense-organs found by Graber and Meyer (earlier noticed briefly by Leydig) in the antennæ of Diptera, the important anatomical distinctions discovered by Forel in different groups of ants, the strange modification of the tip of the spiral tongue in *Ophideres*, which Darwin, Briteubach and Künckel have discussed, and, above all, the extensive investigations of the nervous system in insects generally, which Brandt has recently undertaken, the exquisite memoir of Grenacher on the structure of the compound eye, and the keen researches of Graber in various departments of insect anatomy, show, by what has been accomplished, how many harvests are still unreaped. The microtome, too, has put a new instrument of precision into the hands of the investigator in this field.

We might in the same way point out some of the special needs in the study of the finer anatomy or histology of insects, but the pressure of other duties borbids a further pursuit of the subject. Enough surely has been suggested, even in this hasty sketch, to show that we cannot yet rest upon our oars, but must push forward undaunted into still unknown waters. If these few words shall arouse in any one a higher ambition, leading to better work, their aim will have been accomplished.

On motion of the Secretary, B. P. Mann, the minutes of the last meeting of the Club were adopted as printed in the *Canadian Etomologist*.

The President read portions of a letter from Mr. Wm. Saunders, of London, Ont., explaining his absence owing to a severe accident, and expressed the great regret felt by all present that Mr. Saunders was not with them, and that his absence was occasioned by so unfortunate a cause.

The election of officers then took place (by ballot) with the following result:—

President.—Dr. John G. Morris, of Baltimore, Maryland.
Vice-President.—C. V. Riley, of Washington, D.C.
Secretary.—B. P. Mann, of Cambridge, Mass.

Mr. A. R. Grote, of Buffalo, N.Y., delivered an able and interesting lecture on certain generic characteristics of the *Noctuidæ*, which, it is to be hoped, he will prepare for

publication. At the close of his remarks he expressed his anxiety that describers of *Noctuids* should refer particularly to those parts on which generic characters are based.

Prof. A. J. Cook, of the State Agricultural College, Lansing, Mich., gave an account of recent investigations in Apiculture. Among many interesting facts he stated that if the wings of the virgin queen be clipped, or the entrance to the hive be so contracted that she cannot fly forth, or, again, if she be reared where there are no drones, she will not be sterile, but from her eggs only drones will be produced; that the fate of the drones in a hive depends on the prosperity of the colony—with a rapid increase of bees and honey they are safe, but if there is a period of adversity in these respects, unless caused by the loss or sterility of the queen, they are speedily destroyed by the workers; that worker bees are imperfectly developed females; that bees possess and employ the sense of smell, and that they have a good knowledge of locality. In answer to a question from Dr. Morris respecting the alleged robbery of fruit by bees, whether they will not perforate ripe fruits if starved for a time, Prof. Cook replied that he had not tried starvation, but he had placed punctured grapes before bees and found that they would sip the juice with zest, but when he replaced the fruit with sound specimens they did not attempt to touch them.

Mr. Scudder then exhibited some illustrations of rare fossil insects, prepared for publication in Dr. Hayden's report, and a large volume of lithographed plates, coloured drawings, etc., of Diurnal Lepidoptera in all their stages, which he had had made to illustrate his proposed great work on the Butterflies of North America.

Mr. J. D. Putnam, of the Davenport Academy, presented some notes on the North American Galeodes (*Solpugidæ*), and exhibited specimens in illustration.

The Rev. H. C. McCook, of Philadelphia, gave a most interesting lecture on the life history of the honey ants of the Garden of the Gods, Colorado, and illustrated it with specimens of the insects and a great number of very large water-colour drawings. He described fully the chambers excavated by the ants, the insects themselves in all their forms, their nocturnal habits, and their feeding upon the saccharine juice exuded from the galls of the scrub-oak. He stated that the workers are undeveloped females, and that the honey-bearers are a changed form of the worker major with a greatly enlarged crop, in which they store the honey. Mr. McCook has not yet committed his observations to writing, but, we understand, that he will eventually publish them in the proceedings of the Academy of Natural Sciences at Philadelphia. It is impossible to give here even a synopsis of the vast amount of information that he afforded upon this interesting subject.

Prof. Riley remarked, in connection with this subject, that many galls secrete saccharine matter, and that sometimes the gall-insects themselves are entrapped in it; that the ants probably get their honey also from the species of *Coccus* that frequents the scrub-oaks of Colorado; and that almost all species of ants are able to expand their abdomens when necessary.

Dr. Haldeman observed that the reason why hills were constructed by some ants and not by others was probably because some might have the proper materials conveniently at hand and others not. He urged Entomologists to domesticate ants in order to study their habits, most of which are as yet very imperfectly known.

Mr. Bassett stated that very many species of galls are infested by ants; that he has observed a gall on scrub-oak swarming with ants, and with *Cetonia Inda* and other honey-loving insects.

Dr. John L. LeConte, of Philadelphia, Pa., read a paper on a collection of *Coleoptera* obtained from a few hickory twigs. Some hickory trees on a friend's estate, near Philadelphia, were observed to be diseased, and therefore cut down. Some of the twigs were sent to him, and from them he obtained no less than twenty-two species of *Coleoptera*. He expressed a strong hope that some competent Entomologist should prepare a list of the insects that infest forest trees, and that it should be appended to the report about to be issued by the U. S. Commission on Forestry.

Dr. Morris stated that he also had obtained a considerable number of species of beetles from twigs.

Mr. Haldeman said that the hickory was more infested with insects than any other tree.

Dr. LeConte next read a paper on the so-called "Lightning Bugs" (*Lampyridæ*).

Mr. Anstin remarked that when a fire-fly is at rest there is a faint ray of light visible, proceeding from the edge of the segments of the abdomen; when the insect is emitting the flashes of light it moves these segments, and so reveals more of the light.

Mr. Martin stated that he had observed a fire-fly in a spider's web, and that it emitted very rapid flashes of light at first, but that they gradually diminished in brilliance till at length they died out.

On motion, the meeting then adjourned till 8 o'clock, p.m.

Tuesday Evening Session.

At 8 o'clock, the Entomological Club met at the Hotel Vendôme, Dr. J. G. Morris in the chair.

Mr. H. F. Bassett, of Waterbury, Conn., gave an account of the "Structure and Development of certain Hymenopterous Galls." He exhibited specimens of galls produced on plants and trees, and spoke of the alternation of two forms belonging to one species. The seminator deposits its eggs in the young acorn, and from the sting or puncture the gall grows, having the appearance of another acorn. This falls to the ground in September, and remains twenty-one months, at the end of which time the gall-flies are produced, which are all females. These females lay their eggs in the buds of the trees in the spring, and from these galls are formed, out of which are developed flies of both sexes. All galls may be divided into two classes:—First, those formed in autumn, which do not develop till the next or a succeeding year, the imagoes or perfect insects hatched from them being always females; and secondly, those formed in the spring, the progeny of which are of both sexes. He considered that the woolly substance that covers these galls is an excessive development of the pubescence of the leaf, and thought that the growth of the galls is produced by the action of the poison that is infused by the parent insect when making the sting or puncture, because he often could find in a gall no trace of any larva.

Prof. Riley expressed his opinion that galls are formed both by the poison injected with the egg, and by the irritant action of the larva. He spoke also of the sweet exudation on galls, and remarked that honey-dew is in some cases the natural exudation of the plant, independent of the action of insects upon it.

Prof. C. H. Fernald, of Orono, Me., exhibited three volumes recently published by Lord Walsingham, on "North American Micro-Lepidoptera, Tortricidæ," illustrated with coloured plates, and forming part of the British Museum Catalogues for 1879; also, by the same author, a volume on the "New and little-known Species of North American Tineidæ," and another on "The Pterophoridæ of California and Oregon." He then proceeded to read a paper on the Classification of *Tortricidæ*, illustrating his remarks by some wings prepared for the microscope. These slides, which beautifully exhibited the venation of the wings, were mounted with glycerine boiled gently over the lamp; the wings were bleached by Dimmock's process.

Dr. H. A. Hagen, of the Museum of Comparative Zoology, Cambridge, Mass., read a paper on the importation of the Hessian fly. The generally accepted theory, from which the insect derives its common name, is that the insect was brought from Europe to America, about a century ago, in the straw used for bedding by the Hessian troops employed by the British Government in the war of the Revolution. This theory Dr. Hagen rejects, and in a sketch of the history of the movement of these troops, he showed that the lapse of time during their transportation was considerably greater than that of the term of the normal development of the fly from the egg. He stated that there was some evidence of the existence of the fly in America before the arrival of the Hessian troops, and that it was unknown in Central Europe till recently; there was, however, some evidence that it may have appeared in certain places on the Mediterranean coast at an earlier period. He even thought it possible that the fly might have been imported *from* America into the Mediterranean region of Europe by American trading vessels. His conclusions, as stated in a long and very interesting paper, in which he quoted many German and British official records, may be summed up briefly as follows: 1. It is impos-

sible that the fly could have been imported by Hessian Troops, as proved by the historical records. 2. The fly must have been in America long before the arrival of the Hessian troops. 3. The fly was not known in Germany before 1857, and is probably an indigenous American insect.

Prof. Riley stated that he had so often noticed a retardation of development in insects, that he should not be surprised if this had been the case with the Hessian fly, when imported. Again, that the "flax-seed state" of this insect lasts so long that it might have crossed the Atlantic during that phase of its existence.

Dr. Hagen replied that Dr. Asa Fitch had already proved the impossibility of this.

Prof. Riley accepted the theory that the fly is indigenous to America, and Dr. Hagen stated that he believed that it is indigenous to both Europe and America.

The meeting then adjourned.

Wednesday Afternoon Session.

The Club met for an hour, at 5 o'clock, p.m., in one of the rooms of the Massachusetts Institute of Technology, a large and commodious building, which was almost entirely given up to the work of the Association.

The short time at the disposal of the Club was occupied by the continuation of the Rev. H. C. McCooks lecture on the Honey-ants of the Garden of the Gods, Colorado; the first portion of which he delivered on the previous afternoon. At its conclusion, some remarks were made by Prof. Cook and others, on birds *versus* insects.

Thursday was devoted by the the Association to a visit to Cambridge. Many of the Entomologists took the opportunity of visiting the rooms of the Cambridge Entomological Club, where they were received by Mr. B. P. Mann, the Secretary.

Friday Afternoon Session.

The Club met in their room in the Institute of Technology at 4 o'clock p.m., Mr. A R. Grote, Vice-president, in the chair.

Dr. LeConte moved that, owing to a resolution passed at the general session of the Association that morning, the Entomological Club do now organize as a permanent Sub-section of the Association. He proceeded to congratulate the Club on the honour thus conferred upon it. It was due to the importance of the subject and the large attendance of Entomologists, no less than to the number of interesting papers offered for their discussion. The resolution was unanimously adopted, and the Club at once organized as a Sub-section with the officers elected on the first day of meeting.

Mr. E. Burgess, of Boston, gave an account of the structure of the mouth organs of Butterflies, describing especially and illustrating with diagrams on the black-board, the proboscis, etc., of the *Archippus*. Remarks were made upon the paper by Dr. Hagen and Messrs. Mann, Cook and Riley.

Dr. Hagen read a paper on the anatomy of *Prodoxus decipiens*, in which he confirmed Mr. Riley's statements.

Prof. Fernald read a paper on *Phoxopteris angulifasciana*, a small tortrix feeding upon clover.

Mr. O. S. Wescott, of Racine, Wis., gave by request an account of a moth trap for collecting insects by light, which he had employed with much success. Dr. Hoy and Mr. Mann also described insect traps that they had found useful.

Mr. Westcott gave an account of the mode of building its web by a geometrical spider, and stated that the insect when forming the concentric lines across the rays measured the distance from the next parallel line by means of its second right fore-leg before attaching the thread to the ray.

Prof. Cook, in answer to a question, stated that he had found a mixture of honey and beer equally efficacious with the ordinary mixture for sugaring.

Mr. Grote remarked that he had found the Colorado potato beetle feeding upon a large cultivated variety of Datura, and feared that it would probably soon prove a serious enemy to the tobacco plant, another member of the family *Solanaceæ*.

Prof. Riley stated that he had found the Colorado beetle in South Carolina.
The meeting adjourned at 6 o'clock.

Monday, August 30th.

The Sub-section of Entomology met at the Institute this morning, Dr. J. G. Morris in the chair. For the first time the titles of the papers to be read, with the names of the officers, were published in the Association programme for the day.

Prof. Fernald gave a brief description of his method of preparing and mounting the wings of *Micro-lepidoptera.*

Mr. B. P. Mann gave an account of the contributions of the Cambridge Entomological Club and the progress of Entomology.

Prof. C. V. Riley described the life-habits of several bee-flies (*Bombyliidæ*), and made some remarks on tree-crickets and on the early stages of *Blepharocera.*

Dr. Hagen exhibited a specimen of *Passalus cornutus*, which was entirely destitute of any trace of elytra, but possessed wings and all other parts quite perfect. He stated that it was impossible that the elytra had been artificially removed and that he considered this to be a very rare natural deformity.

Rev. C. J. S. Bethune, in the absence of Dr. Hoy, who was to have read the next paper on the occurrence of *Aletia argillacea* in Wisconsin, stated that he had learned in conversation with Dr. Hoy that this moth had occurred in immense numbers on ripe melons near Racine, Wis., and that he had himself in the autumn of 1865, taken a great quantity of the moths feeding on fallen plums and apples, but that ordinarily the moth was not at all common in Ontario.

Prof. Riley considered that the *Aletia* flew to the north when superabundant in its natural home in the cotton growing regions of the south ; that it fed there on some malvaceous plant, lived a year, but not probably longer, and then was no longer to be found in northern localities until another emigration took place when it again became numerous. He did not think that it could possibly live for more than a few generations in the Nothern States or Canada.

Mr. Mann was of opinion that it must live for years in the north, finding some suitable food plant, though like very many other insects it was frequently scarce and then suddenly appeared in great numbers.

Dr. Lintner stated that he had found the moth at an altitude of 1800 feet on the Adirondack Mountains, and that Dr. Hoy had informed him that he had taken the larva in June at Racine.

Dr. E. L. Mark described some points in the anatomy of the *Coccidæ.*

The list of papers having been exhausted, the Section now adjourned to meet next year in Cincinnati, Ohio.

POPULAR PAPERS ON ENTOMOLOGY.

Entomology for Beginners.

By James Fletcher, Ottawa, Ont.

Entomology seems to be gradually throwing off the veil of contempt under which it has been so long hidden. The Botanist has always to a certain extent been deemed a philosopher from the important part plants play in Pharmacy ; the Geologist and Mineralogist, too, from the possibility of their discovering precious metals have been treated by the outside unscientific world as sages worthy of some respect. Entomologists, however, have not thus been honoured by the masses. The question would be asked—What tangible results can come from collecting flies and bugs and sticking pins through them ? and in vain the amount of damage done by insects year by year might be estimated and pointed out. Tl is state of affairs, though, I believe, is now at an end. The claims of the science on all agriculturists and horticulturists are daily becoming more apparent. The institution of the United States Entomological Commission, and the success that has

attended that organization from the happy choice of such men as Messrs. C. V. Riley and A. S. Packard as directors, has perhaps done more than anything else to open people's eyes to the fact that after all there is something in Entomology. In Canada, too, much good work has been done. In 1868 two Entomological magazines were started, our own important organ, the CANADIAN ENTOMOLOGIST—in August, for Ontario; and *Le Naturalist Canadien*, edited by the Abbe Provancher, in December, for Quebec; to these is chiefly due the progress the science has made in Canada. The editors of the CANADIAN ENTOMOLOGIST—Rev. C. J. S. Bethune (1868-1873), and since that time our present esteemed editor—have always by their many charming and descriptive papers evinced a desire to make the study of Entomology as fascinating and easy as possible for beginners, while at the same time they have paid full respect to their scientific readers. *Le Naturalist Canadien* is published in the French language. It was commenced in December, 1868, from which time the Abbé Provancher has fought bravely, and almost single-handed, against all obstacles, striving by its means to create among the French Canadians a love for the natural sciences, particularly Entomology. I am very sorry to see by the December number, that on account of the grant which the Editor received from the Government having been discontinued, his valuable work may possibly be stopped: this would be a great pity, and every Entomologist ought to give a hand in helping him out of his difficulty. The magazine has been of great value to the farmers of Lower Canada, who in its pages have always received courteous answers on any subjects in the many branches of natural history affecting agriculture.

In the eleven volumes of the ENTOMOLOGIST now published, or in the Annual Reports of the Society, descriptions of nearly all the common Canadian insects, and illustrations of many of them, will be found. I would particularly call attention to a paper in the Annual Report of 1872 by Rev. C. J. S. Bethune, entitled "Beneficial Insects." This gives an outline sketch in a concise manner of the different divisions into which insects are divided and the distinguishing points of each.

With the above mentioned volumes and Dr. Packard's Guide to the study of insects, a very complete knowledge of the rudiments of entomology can be obtained; the rest can only be learned by observation and experience in the field. Undoubtedly the first and most important step of all is to commence a collection. Study can only be carried on satisfactorily from the actual specimens, which should be examined alive whenever possible, and full notes taken of any striking peculiarities observed; when preparing specimens for the cabinet, the one idea which has to be born in mind, and upon which the whole value and beauty of the collection depends, is that they may appear natural, and a knowledge of how to effect this can only be attained by observing living specimens.

THE CALOSOMAS OR CATERPILLAR-HUNTERS.

These insects belong to the family called *Carabidæ*, which is a large and difficult family to study, or even to define and limit exactly. The insects belonging to it are remarkable for their graceful forms, and at the same time for their cruel and predacious habits, both in the larval and perfect states. It is this last trait which makes them such useful auxiliaries to the horticulturist.

Fig 1.

The better known of the two represented here is called *Calosoma calidum*, Fabr., (fig. 1) or "The Glowing Beautiful-bodied Caterpillar-hunter." As an exception to the general rule, its English name is more formidable than the Latin; but so important a personage is its bearer that I will not deprive him of a single letter of his title, and indeed am almost tempted to add to it the words "most useful." It well merits its appellation, *Calosoma* (*Kalos*—beautiful, and *Soma*—a body). Fig. 1 gives a life size representation of it. The colour of the polished elytra or wing-covers is a deep blue-black, and the six rows of dots with which they are adorned are of a fiery burnished red, for which reason it has been called by the specific name of *calidum*. The legs in our figure are two thick and clumsy, but it must be well known to

everyone. It may generally be found in early summer, in damp pastures, either hidden under stones or running in the grass in search of caterpillars and other soft-bodied insects. Jaeger, who first called the members of this genus caterpillar-hunters, says "they may be found every morning and evening upon the branches of trees, looking out for caterpillars and devouring them." They do not, however, restrict themselves to caterpillars, for they will attack and devour a perfect June-bug when fresh from the pupa state and soft, with apparently the same relish as their special dainty, a fat cut-worm. In the larval state they are equally rapacious; they lurk in holes in the ground or under sticks and stones in the daytime, and only leave their retreats as night draws on to go in search of prey. Every spring I have several of these useful and luckily common beetles brought to me by kind friends who have found them in their gardens. To the inquiry "Is this of any use to you?" I have always the answer ready, which somewhat surprises them: "No, but it is of particular use to you; take it carefully back and put it in your garden again; it is the best friend you have there, for it feeds entirely upon your enemies, the wire-worms, cut-worms and white-worms."

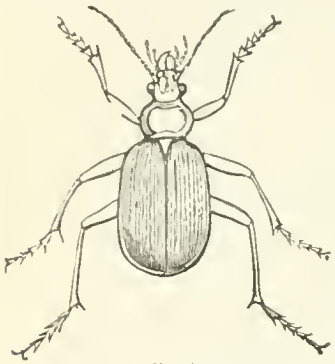


Fig. 2.

I am sure that through the agency of this beetle alone I have been able to gain more respect for the science of Entomology among horticulturists than from all the rest put together.

Much resembling this beetle in shape, but of a very much more striking appearance, is its near relative, *Calosoma scrutator*, Fabr., the "beautiful-bodied searcher," fig. 2. The colour of its wing-covers is bright metallic green, garnished with longitudinal lines and sparcely punctured; round the margin runs an effective line of coppery-red. The head, thorax and legs are almost black; the margin of the thorax having a greenish tinge. The under side is of a deep burnished blue-green hue. Its habits are the same as those of *C. calidum*, but it is a much rarer insect. I have never seen a live specimen; but they are occasionally found in Ontario, and dead specimens are said to be frequently washed up on the outer shore of Toronto Island after a southerly gale.

The Common Woolly Bear *(Spilosoma virginica)*.

By W. Saunders, London, Ont.

The caterpillars known under the common name of "woolly bears" belong to the family of Arctians, and most of the species in the moth state are very pretty objects. The commonest of all the species is *Spilosoma virginica*, a pure white moth which appears on the wing in May, when it deposits its clusters of round yellow eggs on the under side of the leaves of many plants. In a few days these hatch into minute hairy caterpillars, which for a time feed in company, and devour at first the under side of the leaf only, so that it assumes a scorched and withered aspect. In a short time, however, they part company, each one choosing his own course, and blessed with good digestive powers, they eat freely of all parts of the leaf. The full grown caterpillar (fig. 3, *a*) is nearly two inches long, thickly clothed

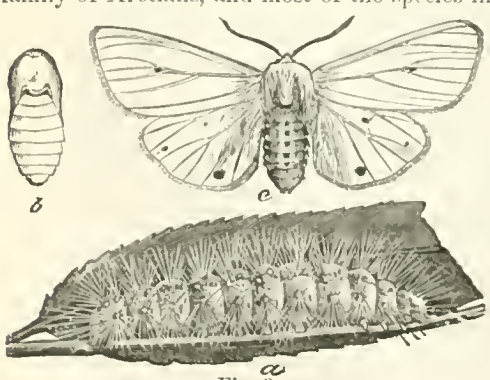


Fig. 3.

with hair usually of a yellowish colour, but not always so, for some are light brown and others a darker brown. The head and feet are usually yellow, and the hairs arise in little tufts from small yellow tubercles arranged nearly in rows across the body. In the spaces between the segments there are darker lines, sometimes brown or dark brown, and occasionally nearly black ; there is a dark line along each side, and the under surface is also of a dark shade.

When full grown the caterpillar seeks some sheltered nook in which to change to a chrysalis, attached to the under side of a board, under the bark of a tree or in some crevice in a fence, wherever it is dry and secluded. Having fixed on a suitable locality, the larva proceeds to divest its body of the covering of hairs, and with these woven together with silken threads, it constructs the slight cocoon which is to shelter the chrysalis, and here in a short time the change takes place. From the chrysalis (*b*, fig. 3), which is of the usual brown colour, in a week or two the perfect moth appears, soon to deposit fresh patches of eggs, from which in a few days the second brood of larvæ are hatched, which attain maturity and enter the chrysalis state before winter comes, and remain in this quiescent condition until the following spring.

The moth (fig. 3, *c*) measures when its wings are expanded from one inch and a half to two inches. The figure represents a female : the males are somewhat smaller. Both sexes have the wings snowy white with a few black dots which vary much in number in different specimens ; in some there are two on each front wing and three on each hind wing, as in the figure, while in others the spots are almost wanting, and there is every gradation between these extremes. On the under side the spots are more distinct than on the upper, and sometimes the white surface is slightly tinged with yellow. The antennæ are white above, dark brown below, the head and thorax white. The abdomen is orange coloured, sometimes streaked across with white, and has three rows of black spots, one above and one on each side ; the under side of the abdomen is white, sometimes tinged with orange.

This species is attacked by several parasites, which destroy immense numbers every year ; were it not for this we should soon be overrun with them.

Tiger Beetles.

By R. V. Rogers, Jr., Kingston, Ont.

There are probably over ninety thousand different species of Beetles in the world, and first and foremost of this mighty legion stand the Cicindelidæ. Well, therefore, might they demand our attention from their high position in the Coleopterous world alone, but they have many other claims on our consideration. They are cosmopolitan—no pent-up Ithaca contracts their powers ; they are beautiful ; they are fierce ; they are blood-thirsty ; they are useful ; and the family name is an old one—known to scientists and men of letters in the days when Jupiter and Juno were king and queen of heaven, to the inhabitants of old Rome.

The family is divided into several branches ; in Canada we have only the representatives of one branch, but it is the original one, the Cicindelas. In the United States there are a couple of other branches as well, which reside principally far to the west.

There is much in a name. The patronymics Smith, Barber, Wright, tell the origin of the family at once ; so *Cicindela* informs us that those that are so called are "bright and shining ones," while the English cognomen of tiger beetle lets all Anglo Saxons know that it is a creature that lives by preying on the blood of others. Brilliant, beautiful and elegant in shape are these beetles, and they appear to revel in the merry, merry sunshine ; on every bright summer day they are to be found running and flying about sunny banks, sandy places, and wherever the god of day beats down his life-giving rays ; most of them avoid vegetation, as it would check their rapid progress ; some species, how-

ever linger in grassy spots among scattered trees. They are among the most predaceous of the Coleoptera; "they act like the tigers among mammalia, the hawks among birds, the crocodiles among reptiles, or the sharks among fishes." In some of them activity, as well as brilliancy of colouring, is carried to the greatest perfection. In the tropics some few genera are found which alight only on the leaves of trees, but further north they are all terrestrial. The species are more numerous in the temperate and sub-tropical regions, and gradually disappear from view as we journey towards the north pole, until in the latitude of Manitoba (as we are told) but two or three are to be found.

Let us take our *instrumenta belli* and go in quest of some of the dozen species we have in Canada (in North America there are about one hundred). Let us hurry before yonder cloud obscures the sun, for then—like chickens in an eclipse—they will retire to their homes. Here is a likely spot, and there are some specimens of our commonest species *(C. vulgaris)*. Go for that one! He sees us as quickly as as we spy him, and is off, flying rapidly for a few yards and then coming suddenly to the ground with his head towards the enemy. Again and again we start him; at length he tires of the chase and takes a longer flight than usual; we know his little plan, and hurry back to where we first saw him in time to see him alight all unsuspectingly, and we easily take him captive in our toils. Let us examine him. He savagely moves his mandibles and tries to pinch, but his bite is inoffensive and not very painful. Some of them give forth a rather strong scent. This one is a little over an inch long, but barely a quarter of one broad; his head is very large, for he has brains; his jaws are very strong, for he has an appetite, and long and curved—a couple of scimitars, in fact, by which he cuts and carves the quivering carcasses of his prey. His eleven-jointed antennæ are graceful, long and slender. 'Tis true that his back is of rather a dull purple colour, but beneath he is resplendent in a beautiful bright brassy green. Each wing cover is adorned with three whitish irregular stripes. His legs are long and slender, just the things on which to hunt the active insects which he feeds upon.

Michelet speaks of the beauty of one of the next of kin of the captive in our fingers thus glowingly: "The rich and living aliment of the unfortunate insect victim apparently communicates to the Cicindela its glowing colours. Its entire body is embellished with them; on the wings a changeful besprinkling of peacock's eyes; on the fore parts numerous meanders, diversely and softly shaded, are trailed over a dark ground. Abdomen and legs are glazed with such rich hues that no enamel can sustain a comparison with them; the eye can scarcely endure their vivacity. The singular thing is, that besides these enamels you find the dead tones of flowers and the butterfly's wing. To all these various elements add some singularities, which you would suppose to be the work of human art, in the

Fig. 4.

Fig. 5.

Fig. 6.

Oriental styles, Persian and Turkish, or as in the Indian shawl, where the colours, slightly subdued, have found an admirable basis, time having gradually lent a grave tone to their sweet harmony."

When we have let go our common Cicindela, *Cicindela vulgaris* (fig. 4), let us look at the pictures of his—not sisters—but of his cousins and his aunts.

The purple tiger beetle *(C. purpurea* Riv.) is figured as No. 5. It is nearly the same size as *vulgaris*, and is often to be found in its company. Its general colour is a

beautiful metallic purple; sometimes, however, it assumes a greenish garb. On either wing cover there is a bent reddish line extended from the outer almost to the inner margin, a dot lower down and another at the extreme tip of the inner margin. It rather delights

Fig. 7.

Fig. 8.

Fig. 9.

in chilly weather, and often appears before the snow is well gone. Mr. Bethune says (Rep. Ent. Soc., 1873) that he has caught it in numbers in April, and on one occasion as early as the 17th March, before the snow was gone.

The six-spotted tiger beetle (*C. sex-guttata*, Fabr.), fig. 6, is a most beautiful insect of a most brilliant metallic green, flecked with three small white spots on each wing cover; Packard calls these markings "golden dots."

The hairy-necked tiger beetle (*C. hirticollis*, Say), fig. 7, is a common species closely resembling, though smaller than, *C. vulgaris;* it is distinguishable by having whitish hairs on its neck.

C. generosa, Dej., (fig. 8), is more strongly marked than the species already mentioned, and is considerably larger.

C. 12-guttata, Dej., is smaller than *vulgaris*, brownish, and decorated with twelve smaller reddish spots.

C. punctulata, Fab., is about the size of *C. 12-guttata*, and has a row of smaller dots along the inner margin of the wing covers, and a couple of irregular lines on each wing cover.

The tiger beetle may well be called a beneficial insect, and is a valuable and should be a valued friend of man, although some of the species living at the sea-shore feed upon small shrimps, to the loss of humanity. Although it does not, like that brilliant murderess, the Dragon-fly (to quote again the gushing Michelet) clear the atmosphere of the gnats and flies that torment mankind, still with its crossed daggers, which serve it for jaws, it accomplishes a swift and almost incredible havoc among the smaller insects. We should take care of it and respect it. It is an efficacious auxiliary to the agriculturist. The farmer by killing tiger beetles becomes the friend of those insect hosts that fatten on his labours—the preserver and protector of those little enemies which devour his substance. The ferocity of these insects is remarkable. They quickly tear off the wings and legs of their victim, and suck out the contents of its abdomen. Often, when they are disturbed in this agreeable occupation, not wishing to leave it, they fly away with their prey; but they cannot carry a heavy burden to any great distance.

They are true children of earth. The eggs are laid in the earth, and in the earth the grubs are hatched, and in the earth they spend their days, and in the earth they prepare their shrouds, and enwrapped therein sleep their pupa sleep through the long winter, and with the returning warmth of spring crawl out of their earthy chambers to run and sport on earth, seldom using their new found wings to fly away from their beloved mother.

The grubs are curious creatures—hideous hunchbacks (fig. 9), but possessed of brain and stomach. They live in the same localities as their parents, the anxious mother having wisely deposited her eggs where food will be most easily attainable by the larvæ. Let us examine a grub. LeConte says we can easily procure one in spring by placing a fine straw

down one of their holes, for the grub will push it out, and rising above ground in his efforts may be captured. Here is a hole, and down goes a straw. Master Cicindela does not like vegetables, and so seeks to reject it with his broad head; when he shows himself we quickly seize him. A perfect Daniel Quilp we find him, with head enormous, flat, metallic colour, armed with long curved jaws. The legs are six in number, and on the back, half way between the legs and tail, "are two curious tubercles, each terminating in a pair of recurved hooks." The head and first division of the body are horny, the rest of the creature is soft. "The larva has all the desire for slaughter evinced by its parents, but its delicate skin, long body and short legs, not only prevent it from chasing prey, but from attempting a struggle with an insect of any size; nevertheless this imperfectly armed creature manages to obtain its food without exposing itself to much risk. With its short, thick, spiny legs it loosens the earth, and then using its flat head as a shovel, and turning itself into a Z, hoists up the clay and upsets it around the mouth of its intended hole. With head and legs, perseverance and time, it sinks a shaft as large in diameter as a lead pencil, and about a foot in depth. (Dr. Duncan says that in England *C. campestris* runs a horizontal gallery as well.) The loose earth around the opening gives way on the approach of any insect and precipitates it into the jaws of the Cicindela, which then descends into its cavern and there at its leisure devours its food." The insect crawls in its tunnel with ease, and if it wishes to remain set fast it sticks the back of its body against the sides and rests safely with the aid of its hooks. In this position it can poke its head out of the ground, thus closing the entrance of its tunnel and awaiting until some ant or other insect passes over. The top of the larva's head forms the floor of the cavity, and when an insect touches it the larva descends at once and with great precipitation, and thus the victim falls into the hole. When fully grown the larva closes up the mouth of its abode, and in quiet and solitude undergoes its metamorphosis, lying dormant during the winter months.

The Tomato Worm (*Sphinx quinque-maculata*, Haworth.)

By the Rev. C. J. S. Bethune, Port Hope, Ont.

Almost everyone, I imagine, has had at some time or other his wonder and curiosity excited by the strange-looking pupa of the tomato worm, as it is familiarly termed. It is frequently discovered when digging potatoes in the autumn, or disturbing the soil where tomatoes have been grown. This singular object, which is very correctly represented in the figure, is about two and a half inches long and half an inch in diameter, of a chestnut brown colour, and round in shape, tapering towards both ends; from one end, which is the head of the specimen, there proceeds a long curved proboscis like the handle of a jug; the other end is divided into broad rings, and terminates in a point. To one who had never seen anything of the kind before, this object must at first prove a great puzzle; but a little careful examination will remove some of the mystery. It must be alive, for the tail end moves; but it cannot walk or crawl, and is quite helpless. If we examine it more closely, we find that the rings that move when the creature is touched are very like the rings of a large caterpillar, while at the other end we can trace the eyes, antennæ, and even the short wings of a moth, but all enclosed in a hard brown shell. These things show us that it is an insect in its helpless pupa state; the long jug-handle is the case which contains its tongue for sucking out the nectar from flowers. If we keep it in some damp earth till the next year, there will emerge from it a large handsome moth, of an ashen-grey colour, relieved by five bright orange-yellow spots on each side of its body; its wings expand fully five inches in length, and its body is about the same length as the pupa or chrysalis; its tongue is of immense length, about double that of the body—when at rest it is coiled up like a watch-spring beneath the head of the insect. The name of the creature is the five-spotted sphinx [*Sphinx (Macrosila) quinque-maculata*, Haworth].

The larva or caterpillar of this insect, when fully grown, is larger than it is shown in the figure, being as thick as a man's little finger, and over three inches in length. It feeds on the leaves of both the tomato and potato plants. It varies so much in colour

that people often suppose that a number of different species of "worms" are attacking their plants. It is frequently of a bright green marked with white, and having along each side a series of seven oblique greenish-yellow stripes; again it may be found with its general colour dark green, dark brown, blackish green, and other shades, even to deep black. On the last segment of the body there is a curved horn or tail. The accompanying wood-

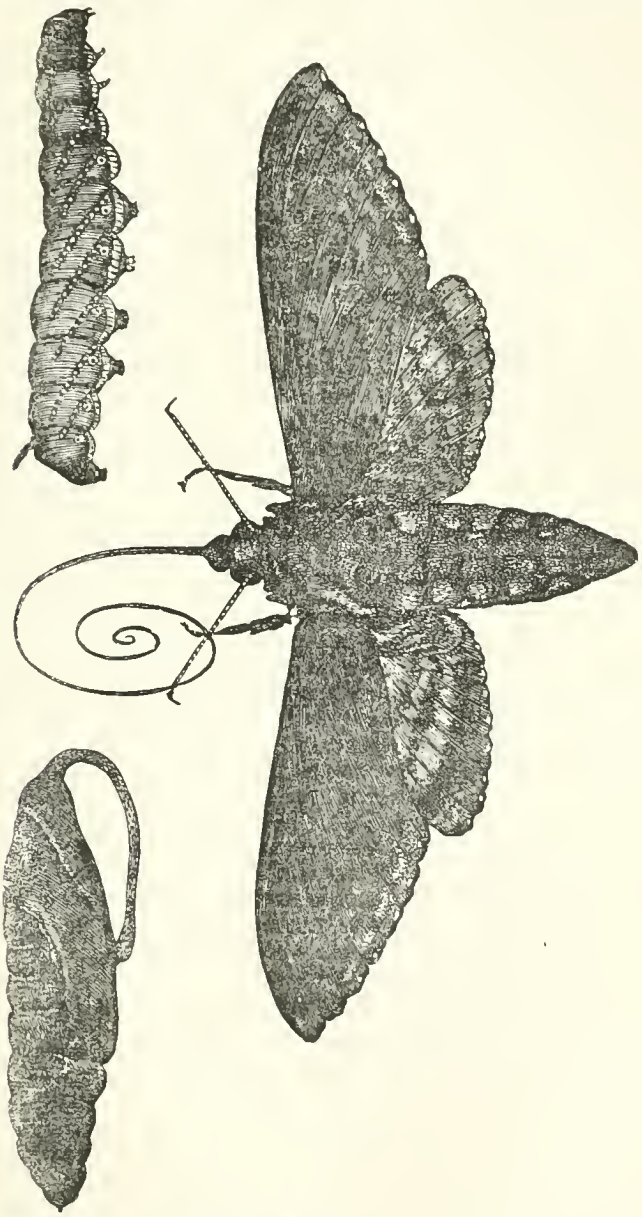


Fig. 10.

cut (fig. 10) affords so satisfactory a representation of the three stages of the insect that it is unnecessary to enter into a minute detailed description.

The larva is found feeding during July and August. It often so closely resembles the foliage on which it reposes, the bands on its sides mimicking the ribs of the leaves,

that it cannot always be detected; its presence, however, may usually be traced by the singularly marked cylindrical pellets of excrement on the ground, and the stripped leaf-stalks of the plant. When fully grown the larva descends into the earth, and there makes a chamber for itself in which to change to its pupa state. Fortunately the insect is not a very common one, its numbers being kept in check by a small ichneumon-fly; otherwise from its size and voracity it would prove most destructive. Very rarely are more than a few specimens seen in a tomato or potato patch. In the summer of 1878, however, as I recorded in the CANADIAN ENTOMOLOGIST (vol. x., p. 218), it was so abundant that a market-gardener who lives near me gathered four bushels of the caterpillars off an acre and a quarter of tomatoes in one day! That year some of the insects attained to the moth or imago state in October, but generally the pupa remains quiescent in the ground till the following season, and the moth appears in June or July. I have now in my possession a living chrysalis of this insect that belonged to the abundant brood of 1878. It was given to me by Mr. David Smart, of Port Hope, who found it, with a large number of others, in his garden. He kept the chrysalids in a box of earth in his cellar all last year; no doubt the coolness prevented the development of the imago. He and I are now both watching with much interest for the appearance of the moths from our specimens, as two years in the pupa state is by no means a common occurrence. That the pupæ are still alive is shown by the readiness with which they move the segments of the abdomen when handled or disturbed.* Notwithstanding the extraordinary abundance of the larvæ in 1878, there were but few to be seen last year in this neighbourhood.

An account of the "tomato worm" will hardly be complete without some reference to the supposed poisonous character of the larva. Some ten years ago, when in charge of the Entomological department of the *Canada Farmer*, I took the trouble to trace up some of the stories then very common in the newspapers about cases of poisoning and death from the effects of the bite or sting or venomous spittle of this insect! The result of my inquiries in many instances proved to be exceedingly amusing. In every case I found that no one could give any information whatever as to even the name of the person who was supposed to have died from the effects of this insect, nor could I obtain a single authentic instance of injury from it. This was, of course, what was to be expected, as the caterpillar is physically incapable of injuring anyone with its bite—much less with its tail or horn, or imaginary sting. In all probability these stories have originated in the fact that persons have been severely affected by getting some of the juices of the tomato plant into an open cut or sore, and then ignorantly have attributed their trouble to the venom of the ugly but innocent caterpillar.

MIGRATORY INSECTS.

By G. J. Bowles, Montreal, P.Q.

The migratory instinct, common to so many species of birds, and even of mammalia, is also exhibited by many species of insects. In the case of birds and animals it has mostly to do with variations of climate, or the necessity of suitably providing for the raising of their young; in the case of insects the causes of migrations are not so evident, and observation is required in order to decide the point, if, indeed, it can be decided at all. The subject is still in obscurity, though the efforts of American Entomologists have thrown a little light upon it with regard to some species. And it is of great interest, not only to Entomologists, but also to tillers of the soil, as some of the insects which exhibit this migratory instinct are among the most injurious to the crops of the farmer and fruit grower.

THE LOCUST.

Chief among the migratory insects stands the locust, considered as a group. On each of the continents, both of the old and new worlds, some species of the locust tribe have from time to time been notorious for this habit, not only on account of the countless numbers in which they have appeared, but also on account of the terrible destruction they

* The Moth emerged from the pupa referred to on the 27th of May, after being nearly two years in that state.

have caused. As far back as the time of Moses their ravages are mentioned, for one of the plagues brought upon Egypt just before the departure of the children of Israel was the plague of locusts. In Asia, Africa and Europe their invasions have been recorded in history, both ancient and modern. To show the magnitude of the effects consequent on their migrations, I give a few instances, as taken by Dr. Packard from different historical sources. The first account, after Joel in the Bible, whose descriptions apply to Egypt, Syria, Palestine and Asia Minor, is the statement of Orosius that in the year of the world 3800 certain regions of North Africa were visited by monstrous swarms; the wind blew them into the sea, and the bodies washed ashore "stank more than the corpses of a hundred thousand men." Another locust plague, resulting in a famine and contagious disorders, according to St. Augustine, occurred in the kingdom of Masinissa, and caused the death of about 800,000 persons. Pliny states that the locusts visited Italy, flying from Africa. In Europe locust invasions have been recorded since 1333, when they appeared in Germany. Mouffit states that in 1478 the country about Venice was invaded, and 30,000 people died of famine. In France swarms appeared at the close of the Middle Ages. In 1747 there was a great invasion of Southern and Middle Europe. Before and after this date vast swarms were observed in Asia and Africa. In Russia, whose southern plains form the home of the locust, vast numbers have often appeared and done great damage. In China records exist of the appearance of these insects in devastating numbers 173 times during a period of 1,924 years. The three great causes of famine in China are placed as flood, drought and locusts.

The new world has also its migratory locusts, equally destructive with those of the old. The Rocky Mountain locust, of which we all have heard so much, is not the only species. Central and South America have also their peculiar locust. Their ravages have been noted by the old Spanish chroniclers of Mexico and the adjacent countries from the time of the first conquest. In 1632 parts of Mexico were overrun with them, and in 1738 and '39 there was an invasion by them of the coasts of Oaxaca, after which a famine occurred in Yucatan. In 1855 and '56 Honduras and Guatemala were invaded, and a famine and pestilence of fever followed. And in 1835 Chili and the eastern part of South America were infested with vast swarms of locusts.

The Rocky Mountain locust *(Caloptenus spretus)* having been a subject of observation by the most eminent Entomologists of the United States, we know more about its habits and economy than about those of any other species. The terrible devastations it has committed in the Western States have led to this result. When an insect destroys the crops in one year to the estimated value of $45,000,000, it is about time to study its history and habits. Mr. Riley has published a most interesting book on the subject, and from this I have culled a few of the most striking items. Its home is on the elevated plateau of the Rocky Mountains, whence it migrates in favourable seasons to the west and south for hundreds of miles, laying waste the crops wherever it alights and doing terrible damage. It breeds in the regions to which it migrates, and the next generations migrate again north and west towards the "metropolis" of the species, and gradually die out on the way, while those that remain in the place of their birth also die out, so that the species becomes extinct in these localities in a few years.

The observations made, so far, give no special reasons for these migrations, unless it be the unusual abundance of the species and the consequent scarcity of food in its native regions. One or two favourable seasons cause the insect to increase to an immense extent, and when they find the supply of food failing them, they mount into the air in countless millions, and, favoured by a westerly or north-westerly wind, sail off towards the settlements in search of "fresh fields and pastures new." Such is the principal reason given by Packard, though he says possibly the reproductive instinct may also be concerned. And he does not think that these movements can be the result of a real migratory instinct, because their migrations (as well as those of the locusts of the old world) are periodical, long intervals sometimes existing between them, so that the development of a migratory instinct would be impossible. If once partially implanted, the long succession of non-migratory years would effectually break up the germs of such an instinct.

Another curious fact in connection with these locusts is, that the generation born in the region to which the species has migrated the previous year, shows a tendency to return

north and west towards the primal habitat. This has been proved by repeated observation. One reason for this is found to be the prevalence of favourable winds at that particular season in the regions where these locusts are produced; for locusts, and indeed, all migratory insects, are dependent to some extent upon the winds for assistance and direction in their migrations. This is true for locusts all over the world; they are brought by the wind and taken away by the wind. A striking instance of this fact is given in the account of the great Egyptian plague of locusts in the Book of Exodus.

So with our American migratory locust. The general direction of the winds on the eastern slopes of the Rocky Mountains and on the plains is, during July and August, west or northwest. These are the months during which the locusts come down from their mountain home to invade the cultivated plains of the border States. And when the generation of which these are the parents attain the winged state, in the following June, it has been found that the prevailing winds are from the south and southeast, and thus are favourable to the flight of the locusts in a northerly or westerly direction.

As regards their powers of flight, it has been proved by experiment that the locust, when it has a favourable wind (and it rarely flies at any other time), does not fly faster than the wind, but merely uses its wings to sustain itself in the air, and allows the breeze to waft it along. An observer proved this by ascending to the top of the State University of Nebraska when a swarm of locusts was passing, and letting loose among the flying grasshoppers small bunches of cotton. He found that the cotton sailed along quite as fast as the grasshoppers did.

Their numbers are inconceivably great. A British officer who saw a swarm in Syria estimated their number at 180,000,000,000,000. The clouds of them seen in the west have often exceeded 50 miles in length by 20 in breadth, with a depth of from a quarter of a mile to a mile; 1,500,000 bushels of their dead bodies were estimated to be lying on the shores of Salt Lake, in Utah, after a visitation of their hordes. And their eggs are found in the ground in numbers of from 100 to 15,000 to the square foot, in localities favourable to their deposition. Such are some of the reliable statistics gathered regarding the Rocky Mountain locust.

A curious and fortunate fact with regard to the locust is that it does not become acclimated in the regions to which it migrates. The hordes from the north, fresh from the invigorating air of the mountains, are much stronger and more vigorous than their progeny born the succeeding year in the plains of Missouri and the other Western States. Professor Aughey, of the State University of Nebraska, tested their muscular strength by attaching their hind legs to a delicate spring balance and observing the degree of strength they exerted. He invariably found that the locusts from the mountains were stronger than those born in the plains. He also found that the mountain insects could live without food for several days longer than the others. Their eggs are also injured by the moister climate, so that it is estimated that fully one-half become addled and never hatch. These circumstances tend to so reduce their numbers in the new habitat that in a few years the species dies out.

b

Fig. 11.

This locust is a near relation of our common Canadian locust *(Caloptenus femur-rubrum)*, fig. 11. The latter has often been injurious to the crops, particularly of grass and hay, but has little tendency to migrate. It has a vast range, from Labrador to the Pacific coast, including the Western States and Mississippi Valley as far south as 35°.

Leaving the locusts, we will pass to the more pleasing duty of noticing some migratory insects which are comparatively harmless, and are far more beautiful than any of the Orthoptera.

Many of the butterflies are inclined to migrations, particularly the whites and yellows *(Pieris, Colias* and *Callidryas)*. These genera, with a few exceptions, are not very plentiful in temperate regions, but have their home in warm climates. So from equatorial and South America, and from the southern parts of Europe have come reports of vast migrations of these butterflies. Bates, in his "Naturalist on the River Amazon," gives an interesting account of the uninterrupted procession of butterflies belonging to the genus *Callidryas* which he saw passing from morning to night in a southerly direction across the

Amazon. In these cases migrations may perhaps be connected with the question of food, or of the continuance of the species.

A butterfly which is well known in Canada, and which has a very wide range, is noted for its migratory habits; it is the *Danais archippus* (fig. 12). Hardly a season passes

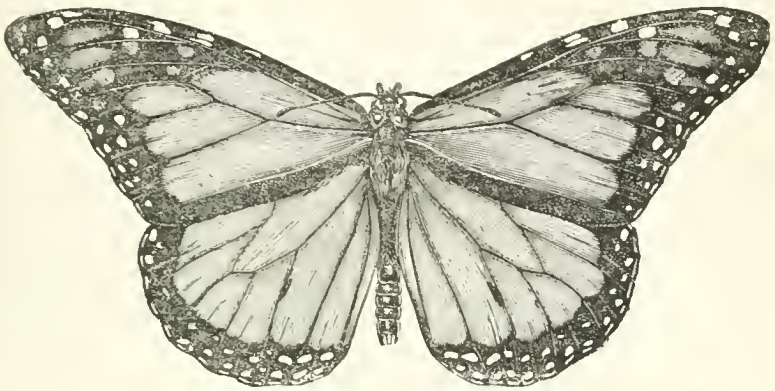


Fig. 12.

but we read of its migrations. Newspapers in the Southwestern States, and the weather signal officers, were constantly reporting the passage over Iowa, Kansas, Missouri and Texas of swarms of this butterfly during the months of September and October last. Even in Canada they are sometimes seen in great numbers on their way either north or south. I myself have seen the shore of Lake Ontario, near Brighton, strewn with hundreds of their dead bodies, cast up by the waves, and which no doubt had formed part of a swarm which from weakness or some other cause had perished while flying across the lake.

Mr. Riley gives an interesting account of the causes which may lead to the migrations of this butterfly in his third report. He says:—"It would be difficult to give any satisfactory reason for this assembling together of such swarms of butterflies. As I have abundantly proved by examination of specimens, the individuals composing the swarms of our Archippus butterfly comprise both sexes; if anything the females prevail. The flights almost always occur in the autumn, when the milk-weeds *(Asclepias)*, upon which the larva of this butterfly feeds, have perished. The instinct to propagate is, therefore, at the time in abeyance. The butterflies, unable to supply themselves with sweets from flowers, are either attracted in quantities to trees that are covered with honey-secreting plants, or bark lice; or else they must migrate southward, where flowers are still blooming. The Archippus butterfly hibernates within hollow trees and other sheltered situations. Southerly timber regions offer most favourable conditions for such hibernation. Under the most favourable conditions a large majority perish. A small portion of the females survive the winter. Such hibernating individuals, upon waking from their winter torpor, make at once for the prairie, where the milk-weeds most abound. Faded, and often tattered, they may be seen flying swiftly over such prairies.

"I have no doubt but that they travel thus for many hundred miles, keeping principally to the north, and ere they perish, supplying the milk-weeds here and there with eggs. A fresh brood is produced in less than a month, and these extend still farther north, until we find the species late in the growing season as far up as the Saskatchewan country, where it can scarcely successfully hibernate, and from whence the butterflies instinctively migrate southward. We can thus understand how there are two, three or more broods in southerly regions, and only one towards British America.

"The exceptional flights noticed in the spring, and which, so far as recorded, take place quite early and in the same southerly direction, find a similar explanation. They may be looked upon as continuations of the autumn flights. Hibernating in the temperate belt, they are awakened and aroused upon the advent of spring, to find the milk-weeds not yet started, and they instinctively pass to more southern regions. There is a south-

ward migration late in the growing season in congregated masses, and a northward dispersion early in the season through isolated individuals."

It will thus be seen that Mr. Riley looks upon the migration of *D. archippus* as something analogous to the southern movement of the birds on the approach of winter, the object in both being the preservation of the species; in the case of the insect to obtain a suitable place for hibernation, as well as a continued supply of food until the time of hibernation arrives; in the case of the bird to secure food when it would be difficult or impossible to get it in a northern climate. The instinct of the butterfly might therefore be looked upon as a true migratory instinct, in contradistinction to that of the locust, which is of a lower order.

There is another butterfly which displays this instinct to a large extent. I refer to the well-known *Pyrameis cardui*, or painted lady. It is a cosmopolitan butterfly, being found in all parts of the world—a result, no doubt, of its migratory habits, conjoined to a faculty of acclimatization. Though I have never actually seen a migration of this insect, I have had no doubt for years past that one did take place in the vicinity of Quebec, I think in 1865 or '66. I had been looking out for the insect for several years, but never saw a single specimen till one summer, when it suddenly became the most common butterfly in the neighbourhood. They could be seen by dozens everywhere. Next year it was not to be found, nor did it return during my stay in Quebec, up to 1872.

I have an idea that others of the genus *Pyrameis*, as well as the species of the allied genera, *Grapta* and *Vanessa*, have these migratory habits to some extent. The same phenomenon, that of scarcity, then extreme abundance for one season, and then disappearance, took place with regard to *Vanessa j-album*. They were so abundant one summer that I even saw them drinking spruce beer from the old applewomen's kegs on the Upper Town Market, Quebec, while next season the only specimen I found was a poor dilapidated individual which I took snugly tucked away under the coping of a fence, where it had evidently passed the winter.

As I said before, the fact of *Pyrameis cardui* being found in all the four quarters of the globe is no doubt due to its migrating propensity. A further proof of this is found in the well-known fact that our *archippus*, originally confined to America (though ranging from Canada to Bolivia), has lately spread over some of the islands of the Pacific to Queensland and New Guinea, and over the Azores to Europe, such extension of habitat necessarily indicating great power of long-sustained flight. Since the Milk-weeds are not plants of commercial value, it is highly improbable that the species has been carried in any of its preparatory states in ships. The fact remains, however, that it has been found as a new inhabitant of those countries. Its powers of flight will hardly be doubted by any one who has attempted to catch it on the wing. But a stronger proof was the exhibition of a *D. archippus* some years ago, by Mr. Pearson, of Montreal, which had been captured on board a ship on the Atlantic, hundreds of miles from land.

On some Long-horned Beetles.

Clytus.

By R. V. Rogers, Jr., Kingston, Ont.

Among the Coleopterous hosts there is a family called Long-horns, or Capricorns, in vulgar parlance; or *Cerambycidæ*, when we are talking learnedly. They derive these names from the fact that they possess very long antennæ (sometimes longer than their bodies), which are generally re-curved like the horns of a wild goat (the Latin *Caper*). They form a very large family; already 4,000 of them are known and recognized by the scientific world. They comprise some of the largest, most showy, as well as most destructive, of the beetles; one of African origin—*Prionus Hayesii* by name—is five inches long and one broad, with antennæ of seven inches and legs of four. The Long-horns are world-wide, and their abundance is in proportion to the richness of vegetation of different countries, so that South America, India, Ceylon and the Moluccas contain a great number of the most beautiful and the largest capricorns.

They have earned the name of Borers because they are, in fact, "animated gimlets," and spend their lives while in the larval state in perforating and feeding upon trees; some live and carry on their operations in the trunks, others in the branches; some devour the wood, others the pith; some are found only in shrubs, some in the stems of herbaceous plants, others confine their attentions to the roots. Some are to be found only on one species of plants, others have a wider range. Some bore straight holes, others branch off at divers angles, others make tracks as various as those of an engraver, while some are regular screws. The Germans, lovers of music, as they are, call these beetles "Fiddlers," because they give forth, especially when annoyed or taken in the hand, a squeaking or rasping noise produced by rubbing the joints of the thorax and abdomen together. Some of the family are not only musical-boxes, but scent bottles as well, and emit a fragrant odour not unlike that of otto of roses.

The members of this family, as a rule, are very handsome, and readily attract notice by their elegant forms and resplendent attire, that is, when of full age; when young—in the creeping age—they are ugly in the extreme. Harris tells us that the various members of the family resemble each other in the following respects: the antennæ are long and tapering. The body is oblong, approaching to a cylindrical form, a little flattened above, and tapering somewhat behind. The head is short and armed with powerful jaws. The thorax is either square, barrel-shaped or, narrowed before, and is not so wide behind as the wing-covers. The legs are long; the thighs thickened in the middle; the feet four-jointed, not formed for rapid motion, but for standing securely, being broad and cushioned beneath, with the third joint deeply notched. Most of these beetles remain upon the trees and shrubs during the day time, but fly abroad at night. Some of them, however, fly by day, and may be found on flowers, feeding on the pollen and blossoms.


Fig. 13.

The pride of our Canadian forests, the maple tree, suffers much from the attacks of *Clytus speciosus* (fig. 13), the largest of our native members of the family. This beautiful beetle is easily recognized; it is about in inch in length, and the third of one in breadth. The head is yellow with antennæ and eyes of reddish black. In shape the body is somewhat cylindrical, a little flattened above and tapering behind. The thorax is black with two yellow transverse spots on each side. The wing covers for more than half their length are black, for the rest they are yellow; they are gaily ornamented with bands and spots arranged as follows: A yellow spot on each shoulder, a broad yellow curved band or arch, of which the yellow scutel forms the keystone, on the base of the wing covers; behind this a zig-zag yellow band forming the letter W; across the middle another yellow band arching backwards, and on the yellow tip a curved band and a spot of a black colour; the legs are yellow.

The under side of the abdomen is reddish yellow, variegated with brown. The female has the advantage of her mate in size, but her antennæ are somewhat shorter. She possesses a pointed tube at the end of the abdomen, through which the eggs are passed from her body into the cracks and crevices of the bark. The tube can be contracted or extended at the will of the fair owner and to suit the emergency of the case.

The parent lays her eggs on the bark of the maple in July or August. As soon as the grubs are hatched they burrow into the bark, and there find protection during the cold of winter. When the warm days again return the larvæ begin again their labours, penetrating deeper and deeper into the heart of the tree, sometimes tunnelling as much as three inches into the solid wood, they make long and winding galleries up and down the trunks. A carpenter is known by his chips, so their presence is readily detected by the little heaps of sawdust that they throw out of their work-shops. If in time a stiff wire is inserted into their holes they can be easily put an end to by impaling. They are long, whitish, fleshy, deeply marked by transverse cuts; their legs, although sixteen in number, are merely rudimentary promises of legs, and for ornament, not use; they are of no avail for the purpose of locomotion. Not by means of their eight pairs of legs, but by alternately contracting and extending the segments of their bodies, do these worm-like creatures force their way along, and in order to assist their progress each segment is furnished with fleshy tubercles capable of protrusion, and which being pressed against the sides of their

retreats, enable them to thrust forward by degrees the other segments (Ent Rep., 1872, p. 36).

The head is the box of tools with which they saw and cut their way through the wood; their work "is done slowly but effectively, and their gnawing teeth, though slow in action, are as resistless as the mordant tooth of time."

About midsummer these busy little carpenters who have never seen the light of day, unless by accident, strike—not for higher wages but for a higher stage of existence; they labour no more, but in the innermost recesses of their living homes fold themselves up snugly for their pupa sleep. At first the nymph is soft and whitish, but gradually it hardens and darkens till at last it lies enwrapped in a filmy veil, beneath which all the external parts of the future beetle are visible. The wings and the legs are folded calmy on the breast, while the long antennæ are turned back against the sides of the body and then tucked up between the legs. When at length it has become matured, it breaks its slumbers, forces its way through the bark, and comes out of its dark and narrow retreat to see the world and enjoy for the first time the glorious light of day and the pleasures of legs and wings, and love and passion, and to propagate its race.

Clytus pictus Drury, or the Painted Clytus, is another of our common species. Its form is very similar to that of *C. speciosus*, and it varies from six-tenths to three-fourths of an inch in length. Harris thus describes it: It is velvet black, and ornamented with transverse yellow bands, of which there are three on the head, four on the thorax, and six on the wing-covers, the tips of which are also edged with yellow. The first and second bands, on each wing-cover are nearly straight; the third band forms a V, or united with the opposite one, a W, as in *speciosus*; the fourth is also angled, and runs upwards on the inner margin of the wing-cover towards the scutel; the fifth is broken or interrupted by a longitudinal elevated line, and the sixth is arched and consists of three little spots. The antennæ are dark brown, and the legs are rust-red.

Clytus Robiniæ, Forster.—According to Walsh, the male of this species differs from *C. pictus* in having much longer and stouter antennæ, and in having its body tapered behind to a blunt point, while the female is not distinguishable at all. This insect does great injury to the locust and acacia trees, and appears in the perfect state in September. Harris confounds this with *Clytus pictus;* in fact, it was long considered by Entomologists to be identical with it. It has sometimes been known as *Clytus flexuosus*, Fab.

During comparatively late years *Robiniæ* has been extending its sphere of operations. For a long time it was known only in New York. Some thirty years ago it appeared in Chicago, and in 1863 it was seen two hundred miles further west. In 1855 it was first observed in Montreal; in 1862 it was very destructive to the locust trees around Toronto; In 1873 Mr. E. B. Reed saw it in enormous numbers in London, Ont. Now it seems to be quite at home in all parts of Ontario. Harris, speaking evidently of this, though under the name of *C. pictus*, says: "In the month of September these beetles gather on the locust trees, where they may be seen glittering in the sunbeams, with their gorgeous livery of black velvet and gold, coursing up and down the trunks in pursuit of their mates, or to drive away their rivals, and stopping every now and then to salute those they meet, with a rapid bowing of the shoulders, accompanied by a creaking sound, indicative of recognition or defiance. Having paired, the female, attended by her partner, creeps over the bark, searching the crevices with her antennæ, and dropping therein her snow-white eggs, in clusters of seven or eight together, till her whole stock is safely stored. The eggs are soon hatched, and the grubs immediately burrow into the bark, devouring the soft inner substance that suffices for their nourishment until the approach of winter, during which they remain at rest in a torpid state. In the spring they bore through the soft wood, more or less deeply into the trunk, the general course of their winding and irregular passages being in an upward direction from their place of entrance. For a time they cast their chips out of their holes as fast as they are made, but after a while the passage becomes clogged, and the burrow more or less filled with the coarse and fibrous fragments of wood, to get rid of which the grubs are often obliged to open new holes through the bark. The seat of their operations is known by the oozing of the sap and the dropping of the saw-dust from the holes. The bark around the part attacked begins to swell, and in a few years the trunks and limbs will become disfigured and weakened by large porous tumours,

caused by the efforts of the trees to repair the injuries they have suffered. . . . The grubs attain their full size by the 20th of July, soon become pupæ, and are changed into beetles and leave the trees early in September. Thus the existence of the species is limited to one year."

Space will not permit me to speak of the other members of this interesting and beautiful family—*nobilis*, *luscus*, *campestris*, *undulatus*, *longipes*, etc., each one of which is well worthy of a full description and biography.

Some Notes on Coleoptera for Beginners.

By C. G. Siewers, Newport, Ky.

In answer to a query in the March *Entomologist* as to the rearing of larvæ of wood-boring beetles, I would say that it is very difficult to do after they have been removed from their burrows. Try damp sawdust of the same wood. The better plan where infested timber is found, is to saw into short lengths, pack in tight box and cover with a wet cloth. Many kinds cannot bore in dry wood. Many Buprestidæ perish from inability to perforate the bark of dead trees which has sprung loose from the wood and become hardened by the sun. They then fall an easy prey to ants, roaches and caribs. Where wild grape vines abound, cut them off at the ground in May or June, and let them hang; in early spring saw them into short lengths and box them, and some rare beetles may be taken. Grubs under stones put away in the same ground in tin or glass, kept moist; found under logs, use the log debris, and add some sawdust. Finding two very large grubs with black heads under a log late in the fall, I put them away in a tin can with log refuse and sawdust, and found a male ash beetle and a dead pupa in July. This beetle, *Xyloryctes satyrus* (Fab.), is taken under the roots of ash trees, and falls a victim to its curiosity, for if you begin to dig for them they will come out to see what is going on. I took fifteen from one tree in that way. April and May are generally devoted to searching in logs and dead trees for beetles, when many nymphs can be collected, which can generally be hatched out in a week or two. June and July are the great beating months. I have discarded the beating net for the inverted umbrella, and so will any one who has tried both, as beating the low limbs of trees around the edges of wood will yield tenfold the quantity and variety that bush and weed beating will. Woods protected from cattle and hogs, and full of vines and bushes, are best. Little is got by beating in the interior of woods. Insect life swarms along the edges. Examine the trunks of trees, and where flat stones abound scoop out cavities under them, where Cychrus and various caribs may be trapped; Cychrus are snail-feeders, and some bait traps with snails strung on strings through the shell. The beans of the honey locust yield *Spermophagus Robiniæ*; the fungus puff-ball, *Lycoperdina ferruginea*; all kinds of fungus swarm with beetles, also *Staphilinidæ*. *Pselaphidæ* are taken on the under side of stones, but mostly by sifting around decayed stumps on to a white cloth. Beat wild plum trees and haws when in blossom. Where beetles are found, by carefully replacing stones and bark more may be taken, as their scent remains. I was glad to take a single specimen of that rare and handsome longicorn, *Dryobius sexfasciatus*, in one season, but in the summer of 1878 I found five under one piece of bark of beech; so last season, when I found a small colony under bark on a dead maple, I tied the bark on again, and took seventeen more at different visits. Various beetles are also found on fruit and flowers. In closing, I would advise beginners to put small insects on paper slips or wedges, and not pin them with a No. 2 pin, as it cannot be inserted in cork without plyers, and is very liable to buckle. No. 3 enters cork readily, is not too large for paper slips, and about right for larger specimens. Further, do not use Spaulding's glue; it will turn your wedges brown, as it contains a discolouring acid. Make your own liquid glue—better at one-fourth the cost. Dissolve light coloured glue or isinglass in the usual way: then, while hot, stir in alcohol, or a light coloured, strained vinegar, till it is thin enough, and decant into a bottle. It can then be thinned with a little water, or by warming.

A New Enemy of the Black Spruce, Abies Nigra.

By Dr. H. A. Hagen, Cambridge, Mass.

An enemy of *Abies nigra* sent to me by Mr. C. S. Sargent, from the Arboretum of Harvard University, induced me to compare the literature about the enemies of this tree. To my surprise, all that is published consists of two very excellent papers by Mr. Ch. H. Peck, Albany. One, "The Black Spruce," read before the Albany Institute, May 4, 1875, 8v., pp. 21 ; the other in the New York State Museum's Report of the Botanist, No. 30. I do not remember to have seen these papers recorded in entomological serials. There are noted two vegetable parasites, *Arceuthobium pusillum* and *Peridermium decolorans*. Of insects are recorded a plant-louse near *Adelyes coccineus*,and some Hemipterous gall insect ; also, two beetles, *Hylurgus rufipennis* and *Apate rufipennis*.

The twigs sent to me contained numerous pale spots, the consequence of some dead leaves, three or more, one near the other. The examination of those leaves showed on every one at the base, sidewards, a small round hole. The interior of the leaf was hollow, in some cases only the lower half, where the enemy had not yet finished the work. I discovered directly a small caterpillar, belonging to Tineidæ and probably to the Argyresthians, as the destructive enemy. The biological collection contains no enemy of the black spruce, and no similar destruction of pines, except a somewhat related twig of *Pinus Canadensis*, quoted also as probably done by an Argyresthian larva. In Mr. Chambers' valuable list no Tineid living on spruce is recorded.

The European literature contains only one fact similar to the American. It is recorded that *Cedestis farinatella* hollows the leaves of pines. But until now no American species of *Cedestis* is known. Probably the moth will be raised and the mystery solved; at all events, I desire to draw the attention of entomologists to this enemy. Perhaps it may be more common than is supposed, Prof. Peck stating as a fact that the spruce trees in some parts were said to be dying at an unusual rate, as if affected by some fatal disease. To judge by analogies, the attack made by *Hylurgus* and *Apate* is only a consequence of the previous attacks by other enemies.

Notes of the Swarming of Danais Archippus and Other Butterflies.

While spending the winter of 1875-76 in Apalachicola, Florida, I found one of these *archippus* swarms in a pine grove not far from the town. The trees were literally festooned with buttterflies within an area of about an acre, and they were clustered so thickly that the trees seemed to be covered with dead leaves ; fig. 14 will enable the reader to form some idea of their appearance thus grouped. Upon shaking some of the trees a cloud of butterflies flew off, and the flapping of their wings was distinctly audible. They hung in rows (often double) on the lower dead branches, and in bunches on the needles. I find by my note book that visiting the flock towards evening, it was receiving additions every moment. I caught a net full off a bunch of dead needles, and walking away to some distance and letting them go, all but three returned to the flock. The question as to where they came from seems a very interesting one. I was told by Dr. A. W. Chapman that there was hardly milkweed enough in all Florida to produce one of these flocks, which doubtless do not confine themselves to Apalachicola. During my visit I found two more flocks

Fig. 14.

not far from the first, but neither of these was as large. I should mention that I often observed examples among them *in coitu*.

I have seen *archippus* flocking at the Isles of Shoals, N.H., towards evening, in very much the same manner, having flown nine miles from the mainland. I have also seen clusters of *Vanessa J-album* on tree trunks at dusk in New Hampshire, which seemed to present a parallel to the *archippus* flocks, though of course on a very small scale.

R. Thaxter, Newtonville, Mass.

The assembling of *D. archippus* is perhaps not so frequently noticed as their passing over localities in flocks. Several years ago I saw them congregating in a bit of woods in the neighbourhood of the city which I was visiting at the time. At least every other day they were hanging in a listless kind of manner to the underside of branches in immense numbers, with their wings closed, and not noticeable unles disturbed, very few being on the wing. Their favourite resting place seemed to be dead pine twigs, which would be drooping with their weight, and in more than one instance I saw one too many light and the twig snap, and send a dozen or more into the air to seek for another perch. In going to and from the woods I have seen several of them at once coming from different directions, high in the air, sailing along in their own easy and graceful way, all converging to the one spot. I did not see them depart. I went one day and could not find one in the woods; and as there were thousands, perhaps hundreds of thousands of them, it would have been a fine sight to see them go. The following year they were remarkably scarce, and it was three years before they were even moderately plentiful.

J. Alston Moffat, Hamilton, Ont.

A very remarkable gathering of *Danais archippus* came under my observation, at Racine, Wisconsin, in the first week of September, 1868. The insect appeared in great numbers, and gathered in several swarms about trees in the vicinity. The day was cloudy, but without rain. Shortly after noon the swarms seemed to gather, and settled upon a tree in my garden, a well-formed black oak about 15 inches in diameter at the trunk, and perhaps 40 feet high. The swarm covered the southern aspect of this tree so abundantly that the green of the leaves was quite obscured by the brown of the wings of the butterflies. A few sailed back and forth through the air as if seeking a place to alight, when the wings of those sitting, opening and shutting as if by a single impulse, caused the prevailing colour to shift from the dark hue of the upper surface to the lighter colour of the lower surface. They remained until after nightfall, but were gone when we looked for them in the morning. No attempt was made to capture or count them, but the swarms must have contained some thousands.

S. H. Peabody, Champaign, Ills.

During the first week in July I found *Melitæa phæton* in considerable quantities in a small clearing in Dow's swamp, about one mile south of this city. The swamp is densely wooded with tamarack and a thick undergrowth of *Myrica gale*, *Salices*, *Alnus incana*, etc., besides many herbaceous plants, and among them (but not at all plentiful) *Chelone glabra*. Upon inquiry, I find that this clearing was the exact locality where the late Mr. B. Billings found this butterfly in 1870.

J. Fletcher, Ottawa.

Prof. J. E. Willet, of Macon, Georgia, writes under date of 19th January, 1880: —"I saw *Callidryas eubule* passing here in great numbers during Sept., Oct. and Nov., 1878, from N.-W. to S.-E. About noon, when they were most abundant, there would be half a dozen visible all the time, crossing a 15-acre square of the city. They pursued an undeviating course, flying over and not around houses and other obstructions. They flew near the ground, and stopped occasionally to sip at conspicuous flowers. A geranium

with scarlet flowers, and set in the open yard, attracted most that flew near it. Papers in southern Georgia noticed the great numbers passing at different points; and a friend in southern Alabama sent me specimens of the same, saying that they were subjects of speculation there. About March, 1879, there was a similar migration from S.-E. to N.-W., but in diminished numbers. I saw the fall migrations again Oct. and Nov., 1879, but in smaller numbers than in 1878. A lady of southern Georgia told me that her husband called her attention to the fall migration twenty-six years ago, and that she had observed it every year since. *C. eubule* is found here in small numbers at other seasons of the year."

In the course of the last two or three years several accounts have appeared in *Nature* of the flight of Lepidoptera in large numbers. I observed a similar phenomenon in 1870, which may present sufficient interest to be put on record. In the summer of that year, in the month of August as well as I remember, I was crossing the harbour of this city in the 3 p.m. trip of the steam packet-boat between the city and Moultrieville, on Sullivan's Island, at the entrance of the harbour, a summer resort of the inhabitants of our city. The distance is between four and five miles, and when about half way or perhaps two-thirds, the steamer passed through an immense stream of butterflies crossing the harbour towards the S.-W. They were all of the genus *Callidryas*, whether *C. eubule* or *C. marcellina* (if indeed they be different species) I could not determine. The wind was light, and from the rapid motion of the vessel, it was difficult to say whether the insects were aided or opposed by it in their transit. As the vessel passed obliquely through the stream, their rate of motion could not be determined, and the dimensions of the stream only roughly estimated; it seemed to be six or eight yards wide, about as many high, and extended a hundred yards or more on each side of the vessel. Whence they came or whither they went could not be ascertained; they seemed to be crossing the harbour in a direction nearly parallel to the general travel of the coast.

Lewis R. Gibbes, Charleston, S. C.

APPOINTMENT OF STATE ENTOMOLOGIST FOR NEW YORK.

We learn with much pleasure that our esteemed friend and valued contributor, Mr. J. A. Lintner, of Albany, N.Y., has received the appointment of State Entomologist. A better qualified man for the position could not, we believe, be found. Mr. Lintner has for the past thirty years devoted a large portion of his time to the study of Entomology, and paid especial attention to that practical department of the science which treats of insects injurious to agriculture. The enormous loss occasioned yearly by destructive insects, is now well known, and every means discovered to prevent or lessen these ravages results in a large yearly gain to the cultivators of the soil. The special business of the State Entomologist will be to endeavour to ascertain how this desirable end can best be accomplished. We anticipate good results from this judicious appointment.

OTTAWA FIELD NATURALISTS' CLUB.

TRANSACTIONS NO I.

The records of the first year's efforts of this active and enterprising organization fill a goodly octave pamphlet of sixty-two pages, which is adorned with two excellent plates. From the annual report of the Council, contained therein, we learn that the Club has a membership of over eighty, and that five excursions, for the purpose of collecting objects of natural history, have taken place during the year, with an average attendance of thirty. During the winter months a successful series of soirees were held, seven in number, at

each of which interesting papers were read by members, and the specimens collected on the excursions exhibited. Many of the papers are published in the Transactions; also a list of plants collected in the Ottawa district by the energetic Vice-President, Mr. James Fletcher.

In the successful maintenance of this Natural History Club, Ottawa has set a noble example, which we trust will be speedily followed by similar organizations in other cities of our Province.

OBITUARY.

Professor Samuel Stehman Haldeman, of the University of Pennsylvania, a distinguished naturalist and philologist, and at one time President of the American Philological Association, died on Tuesday evening, September 10th, at his residence in Chickis, near Columbia, Pa., aged sixty-eight years.

Professor Haldeman has long been noted also for his devotion to Entomology. He attended the late meetings of the Entomological Sub-section of the American Association for the Advancement of Science, at Boston, in August, and took an active part in the discussions. At that time he seemed to be in good health and spirits. By his genial disposition and open generous bearing he has endeared himself to a large circle of friends, who will sincerely mourn his loss.

NOTES ON SOME RARE INSECTS CAPTURED IN ONTARIO DURING 1880.

By Wm. Saunders, London, Ont.

Libythea Bachmani.

Twelve years ago, in August, 1868, a specimen of this butterfly was captured on the beach, in Hamilton, by Miss Mills, and a record of this capture, with some observations on the insect, appeared in the November number of the Canadian Entomologist for that year. We have no evidence of its having been found before this, and no records of any such capture since, until the present season, when a good specimen was taken by Mr. J. M. Denton, at Port Stanley.

In fig. 15, we give a representation of this species, which is remarkable for its very long palpi—fully one-fifth of an inch in length, and presenting the appearance of a beak; brown above, whitish below.

Fig. 15.

The wings are angular, and expand about an inch and three quarters. The fore wings are dark brown, with three white spots arranged in a triangle near the tip; the upper inner one largest, oblong, and irregular in form; the lower one is also oblong, but smaller, and the outer one smallest. Beyond the middle of the wing there are two large fulvous spots, the upper one elongated and pointed at both ends, the lower one oblong, irregular, and divided near the middle by a dark brown nervule. The hind wings are dark brown above, with a large, irregular, fulvous patch across the middle.

The under side of the fore wings is paler than the upper, with the same white spots and fulvous markings, the latter somewhat larger than above. The hind wings have a wide brown border on the hind margin, within which they are bluish, iridescent and streaked with brown.

I am not aware that any description of the larva of this butterfly has ever been published.

Papilio Philenor.

This beautiful butterfly, common in the Southern States has usually been very rare in Canada. The general appearance of the insect is given in fig. 16, but it is impos-

Fig. 16.

sible with a woodcut to give any idea of the brilliancy of the colouring. The fore wings are black, with a rich greenish metallic reflection, and a row of white spots, absent in the male, near the hinder margin which is slightly undulating and partly edged with white. The hind wings are of a brilliant metallic bluish green, with six white spots and some streaks of the same colour on the margin.

The under side of the fore wings is of a dull black colour, with the white spots more distinct. The hind wings are very brilliant, with the exception of a large patch at the base, they are of a beautiful steel blue colour, with a curved row of seven orange coloured spots bordered with black, and the upper ones partially edged with white. There is a small yellow spot at the base and a few whitish dots about the middle of the wing, while the marginal bordering of white is replaced by a series of yellowish white spots, growing larger as they approach the upper part of the wing. The male is more brilliant in colour than the female.

This lovely insect is produced from a rather handsome though peculiar looking caterpillar (fig. 17) about two inches long when fully grown, of a black colour with a purplish

Fig. 17.

hue. Immediately behind the head there are two long movable fleshy horns and a number of shorter horns, and orange coloured tubercles on the remaining segments. The eggs are laid by the butterfly, on different species of *Aristolochia*, chiefly on the Dutchman's pipe (*Aristolochia sipho*) and the viginia snake root (*Aristolochia serpentaria*). The larvæ feed in company and when plentiful will sometimes entirely consume the foliage of the plants on which they feed.

Fig. 18 represents the chrysalis of this insect, which is fastened at the hinder extremity to a mass of silken threads and has a band of the same material extending entirely around the chrysalis, beyond the middle.

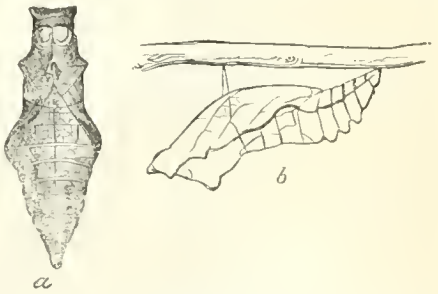


Fig. 18.

In the August number of the *Canadian Naturalist and Geologist*, for 1858, an account is given by the Rev. C. J. S. Bethune, of the appearance of a very unusual number of these butterflies, in West Flamboro'. The writer says, "these butterflies appeared in countless numbers about the lilac trees, as long as they continued in blossom, and then suddenly disappeared. They lasted from the 7th to the 18th of June, but very few appearing after that date." He also says, "I have caught but two in Toronto, though they were numerous there also.

No such good luck has befallen any entomologist in Ontario since that time. Within these twenty-two years several specimens have been taken about Toronto, and two or three some fifteen years ago at Woodstock. There are no records of the capture of this butterfly here for many years past, but this season a specimen was caught by Mr. J. A. Moffat, at Ridgeway, Ontario.

Junonia Lavinia (*Cœnia*).

The first recorded occurrence of this butterfly in Ontario, is found in the November number of the *Canadian Journal*, for 1861, where an account is given by me of the capture of three specimens, at Port Stanley, two by Mr. Wm. Edwards and one by myself. During the same season it was found in the townships of Ellis and Logan, about ten miles north of Stratford. For very many years past I have not heard of a single specimen being taken in Ontario, until this season, when it was captured by Mr. Moffat, at Ridgeway, and by Mr. Denton at Port Stanley.

It is a very pretty insect. The general colour of the upper surface is brown. On the fore wings there is a broad whitish band, extending nearly across the wing and enclosing near the hinder angle a large black eye-like spot, with a central bluish dot and encircled by a yellowish brown ring. In some specimens a second and very small spot is situated near the tip outside the band. There are also two smaller, short, red bands bordered between the white band and the base of the wing.

On the hinder wings there are two conspicuous eye-like spots, the under one much smaller than the upper, and both encircled by a yellowish ring, bordered with black. Between these eye-spots and the hind margin is placed a band of red, margined externally by one or more dark lines.

The under side is paler than the upper, with the markings less distinct.

The caterpillar is said by Boisduval to feed on *Linaria canadensis*. It is black and spinous with two lateral white lines, the upper of which is marked with a row of reddish spots.

Papilio Cresphontes.

In our report for 1878, reference was made to this handsome swallow-tail butterfly, and a figure given of it, but as this report may not be available to many of our readers, we shall reproduce it here (see fig. 19). Since 1878 it has become more common, and has

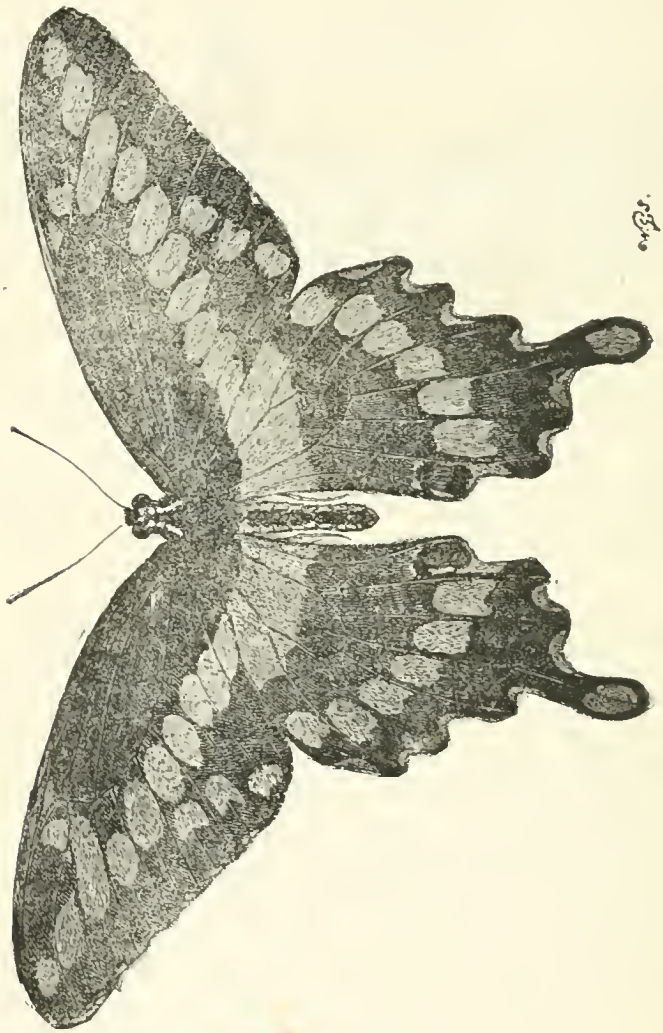


Fig. 19.

been reared from the larva by collectors in Hamilton, as well as by myself. They have been found chiefly on prickly ash (*Xanthoxylum fraxineum*), and on *Dictamnus fraxinella*. This year I found the caterpillars, nearly full grown, in June, which shortly entered the chrysalis state, and produced the butterflies in about a fortnight afterwards. I have also taken the full-grown larvæ late in the fall, which passed the winter in the chrysalis state, from which facts the inference may be fairly drawn that this buttertly is double-brooded in Ontario.

The wings of this stately insect are black, streaked and spotted with yellow, as shown in the figure. The caterpillar is a very singular looking creature; it is brown, with large,

irregular patches of white; the chrysalis is brown, marked with blackish points. For a more minute description the reader is referred to the report for 1878.

The Abbot Sphinx (*Thyreus Abbotii*).

This pretty sphinx moth has been captured in London, during the present season, by Mr. J. M. Denton; it has also been taken in Hamilton, by Mr. Moffat and Mr. David Little, and is reported as having been common there. The caterpillar (see fig. 20) feeds on

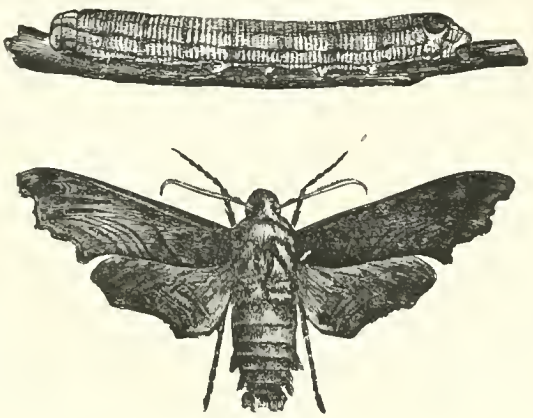


Fig. 20.

the grape vine, and also on the Virginia creeper (*Ampelopsis quinquefolia*). In place of the horn at the tail which caterpillars of this family usually have, there is, in this instance, a polished knob or tubercle. The colour of the larva varies from a dirty yellowish to a reddish brown, marked transversely with fine black lines, and lengthwise with patches of a dark brown shade. There is also a dark line along each side. The under surface is paler, with a reddish tinge along the middle.

The moth (fig. 20) is of a dull pale brown colour, the fore wings variegated with brown of a much darker shade; the hind wings are yellow, with a broad blackish border. Both wings are notched on the margin.

NOXIOUS INSECTS IN ENGLAND.

By the Rev. C. J. S. Bethune, M.A., Port Hope, Ont.

By the kindess of the writer, Miss E. A. Ormerod, F.M.S., I have recently received her "Notes of Observations of Injurious Insects" for the years 1877, 1878 and 1879. These reports contain so much of interest and value that I have thought it desirable to give to our readers some extracts from them that bear upon our own insect enemies, and at the same time draw attention to the valuable work that is being quietly done in England by a band of volunteer workers who, apparently, receive no recognition or encouragement from the Government or the general public. The plan pursued has been to send out a circular in the spring of the year, to a large number of observers scattered over Great Britain, and to recommend to them a list of insects for observation during the season. The replies sent in in the autumn are carefully collated by Miss Ormerod, and the systematized results published during the winter in an octavo pamphlet, illustrated with excellent wood cuts. It is pleasing to observe a steady growth in these reports; that for 1877 contains 19 pages and 12 cuts; that for 1878, 27 pages and 20 cuts; and the last, 44 pages and 27 cuts—

some of the latter are, of course, reproductions of those that appeared in the earlier issues. The insects treated of are those which are injurious to field and garden crops, to timber trees and fruit.

1. The first insect treated of in the reports for 1877-78 is one that is very familiar to us here :—

The Turnip Flea-Beetle

Fig. 21.

or 'fly' (*Haltica nemorum*). Figure 21 represents this insect magnified. During both years it seems to have caused much damage in many localities. "At Knebworth an example is given of the value of surrounding weeds to the farm insects as a means of support till the crops are ready for attack, in the appearance of the turnip-fly first on charlock (mustard) in fields where turnips had grown the previous year, and then causing great injury to the kohl-rabi and turnips"—an argument for clean farming. The following is a curious "remedy" :—"The plan followed is to drive a large flock of sheep on the attacked field early in the morning, whilst the dew is still on the leaf, and, with the help of a dog, to keep them in constant motion, and well up in a body, so as to tread over all the field in turn. Treated in this way no injury is done to the crop; but if much ground has to be gone over, it should be taken on different days, as it would injure the sheep to keep them long without food, or to harass them by the continued driving early in the morning. In this case the extent of ground was 37 acres, and from four hundred to five hundred sheep were put on. The fly at the end of June was so strong as to threaten clearing the crop, and it had almost been decided to plough it up; but this treatment, which embodies disturbing and killing many of the insects by the treading, and which also makes the leaves distasteful for oviposition, both by rubbing of the sheep and the coat of dust scattered in dry weather, saved the plants and was followed by a good crop." Another and simpler remedy for use on a small scale is "sprinkling the young turnips with road dust, which preserved them entirely from injury." An observer states that "where the weather was highly favourable during the sowing season of May and June for a quick and healthy growth, the plants were thus run past the stage at which 'the fly' attacks them, and less injury was inflicted than had been observed for many years. He draws attention to anything that promotes healthy, rapid growth, till the young plant is well into the rough leaf, being the best preventive of the fly, and that, could the remedy be applied, probably heavy waterings in the evening in dry weather might be of service, and notes, in the shape of special applications, caustic lime, soot, and guano, which have each their advocates, applied in the morning when the dew is still on the plant, or gas-water applied in the evening, and also benefit from the use of a small quantity of salt."

Another observer notices that where the fly was particularly destructive the previous year there charlock (mustard) was prevalent. "This weed is common throughout the country, more or less plentiful according to agricultural care, some fields being comparatively free, showing where one farm ends and another begins." [These remarks might be made of several parts of Ontario, especially of the counties of Northumberland and Durham.] He draws attention to the benefit of eradicating the food-plant of the fly during the years when the land is unoccupied by turnips, and thus preventing, or in some degree checking, its annual multiplication.

From all the observations there is noticed "the advantage of a rapid, vigorous growth in resisting the attack of the fly, whether brought about naturally by plentiful rain, or artificially by manure containing the superphosphates or other chemical constituents required, and a word may be added as to the physical effects of rain and dew on the insect. A single drop is enough to clog the legs temporarily, and put an end to its leaping powers for the time being."

2. The Onion Fly (*Anthomyia ceparum*)

is an insect that has found its way across the Atlantic and shown itself very destructive at times in the Eastern States and elsewhere on this continent; the following extracts

may therefore be of use as well as interest. (In figure 22, we have this insect represented in both the larval and perfect forms.) "The eggs of the fly were first observed on the 21st of May, laid where the leaves divide, the larvæ hatching after a few days, and feeding on the seed-blade till they reached the root, then striking into the bulb, if formed, otherwise into the root, and soon destroying the plant. The soil was mostly light, and in high cultivation, and pulverized gas-lime scattered amongst the onions was found to act well in keeping off the insects. Watering the onions with the liquid from pig-sties, run into a tank specially arranged for the purpose, was found to answer still better. Several who adopted this plan secured good crops, whilst in the cases where it had not been followed the crops were for the most part destroyed." Another observer mentions that "he finds deep cultivation in autumn, with a good manuring and sowing in drills on a firm, well-trodden surface in spring, to be the surest means of securing a good crop free from attacks of the maggot." Miss Ormerod mentions that she "tried sowing two kinds of onions in rows along a bed of which half had been prepared in the usual way with farm-yard manure, and half deeply trenched with no manure added. Both kinds of onions on the manured ground did fairly and were uninjured, but on the unmanured ground the plants made no way, and were attacked by the maggot."

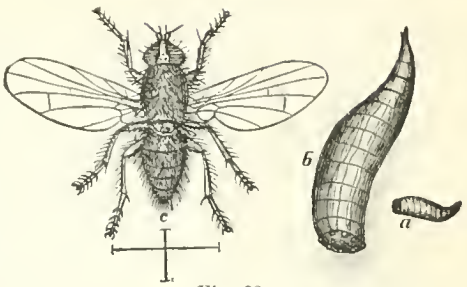


Fig. 22.

3. Cabbage Butterflies (*Pieris brassicæ* and *rapæ*).

It is somewhat singular to notice that so little is said in the three Reports about our


Fig. 23.

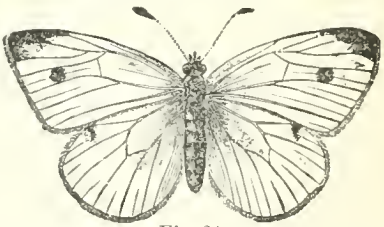


Fig. 24.

very familiar pest, *Pieris rapæ* (see figures 23 and 24), which has come to us from the "old country," while much attention is paid to its congener, *P. brassicæ*, a larger white butterfly which seems to be very destructive. In 1877 it was noticed that "the amount of appearance of cabbage butterflies varied much with the amount of shelter provided for the previous stage of pupation." Where cabbages were chiefly grown in fields few were found, but large numbers were observed to infest sheltered gardens. "A search under dry eaves, rough boardings or palings, and in the sheltered nooks which abound in garden ground, but are comparatively absent in open field cultivation, will at times bring scores and hundreds of pupæ to light, and serve to diminish the pest appreciably."

In 1879, at Dalkeith, *P. brassicæ* appeared in rather formidable numbers after the fine weather set in. The consequence was a severe attack of the caterpillar, especially in cottage gardens surrounded by weedy hedges and other harbours for insects, where the common cabbages, savoys, etc., were completely riddled by the vermin, and rendered totally unfit for human food. The best remedy is hand-picking the caterpillars, but this is tedious. A sprinkling of fine salt is very serviceable, carefully applied by turning up every leaf so that a small portion of the salt shall touch every grub. An application of finely-powdered lime in a caustic state, or even caustic soot, will get rid of the grubs, but both are objectionable with regard to the after use of the vegetables. *P. rapæ* was "moderately plentiful" last year in some localities, but apparently it was nowhere so numerous as it is with us over thousands of square miles.

4. Wire-Worms, or Click-Beetles *(Elateridæ)*.

Fig. 25.

Figure 25 represents one of our commonest elaters, the eyed elater, *Alaus oculatus*. Several species are noticed as attacking various crops, especially barley. Among the remedies employed we may quote :—"A solution of carbonate of soda, in the proportion of about two ounces to sixteen quarts of water, applied three or more times from the beginning of May to the beginning of June is found a good way to clear the ground." An observer notes "wire-worms in considerable numbers attacking barley sown after dead fallow. He drilled Lawes' turnip manure with the bulk of the field, and on this the barley grew rapidly away from the wire-worm ; whilst on two pieces, each seven feet wide, left across the field without the manure, more than half the plants were destroyed. This difference is noted as having been observed on previous occasions. Stirring the land well is considered the best remedy with root crops. Amongst corn (wheat) crops rolling with a heavy roller, or if possible, on the lighter soils with a clod-crusher, is the usual remedy. In one case the object is to solidify the surface and so stop the wire-worms working ; in the other (the root and green crops) to stimulate growth in the young plants, besides disturbing the larvæ."

In the last Report it is stated that the wire-worms did "much damage on some light-land farms, and the young barley after fallow, and where the land was in bad condition ; but where the barley succeeded a good crop of roots, fed on the land by sheep, or where there was plenty of manure in the soil, the plants grew too vigorously to receive much injury. On heavy clay land the soil was so close that the wire-worm could hardly exist."

5. The Wheat Midge *(Cecidomyia tritici)*.

Our dreaded pest is the same insect as that here referred to as prevalent in England. See figure 26. In 1877 it was reported as unusually abundant in Hertfordshire and unusually absent in Essex. It is noteworthy that "in the latter county the chaff is used for cattle, whilst the custom prevailed in some parts of the west of England of throwing the chaff in heaps to decay, thus providing the maggot with good shelter during the winter to develop in the following June, and so infest the neighbourhood."

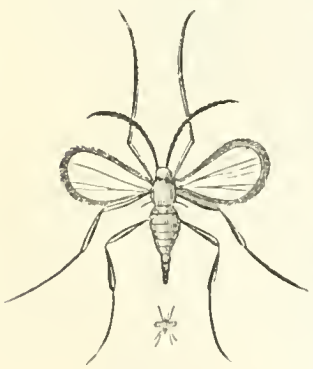


Fig. 26.

In 1878 it was again unusually abundant at the same place in Hertfordshire "in all the early wheat, many ears having from 10 to 15 kernels quite destroyed, besides others being deformed ; the later crops were not so much affected." The same year it was also abundant in parts of Devonshire. A writer relates that the wheat in his experimental field "stood up well at the time of cutting, but that just before blooming, portions were covered by small flies which deposited their eggs in the ear, and these developed into small orange-coloured maggots, which fed on the young grain. The unmanured crop came into ear some days later than the manured crops, and escaped injury from the fly, whereas the plot manured every year with fourteen tons of farm-yard dung suffered severely, and yielded only about two-thirds as much grain as in 1868, when the weight of straw was about the same as this year. It is, "of course," he adds, "very difficult to estimate the damage done to a crop by the ravages of an insect, but that in the permanent wheat field undoubtedly suffered considerably from that cause. The yield of grain was not only much less than would be expected from the bulk of straw and its upright condition at the time of cutting, but also much less than would be judged from the amount of produce and proportion of grain to straw in the neighbouring field."

In 1879 the same observer in Hertfordshire mentions that the midge "was abundant in all the earlier wheat fields, and did much damage, but little to the later crop; wheat ears did not make their appearance till about June 29th instead of June 12th, which may account for the date of the attack." Another observer, in the county of Norfolk, states that "a little patch of wheat, a quarter of an acre, sown in the autumn, suffered much from the wheat-midge; whilst another quarter of an acre close alongside, which, owing to wet and frost, was not sown till spring, was not injured by it." A third observer notices that "on June 27th the wheat-midge was especially abundant, whilst there were as yet no wheat ears in which it could lay its eggs, and that no damage took place from the ravages of the larvæ." The foregoing observations completely justify the remedies that I suggested for this pest in my account of the wheat-midge in the Report for 1871.

6. The Wheat Aphis *(Aphis Granaria)*

in 1879 attacked with extreme severity a field of 110 acres of wheat in Cheshire. (In figure 27 we have a representation of an aphis closely resembling the wheat aphis, highly magnified.) The observer mentions the aphides as first appearing in the early part of August and shortly afterwards they were not as observable; but about September 8th they were again noticeable in as great or greater numbers than before. The ears they had previously attacked had become perfectly white, as if blasted, and at the time of writing, September 16th, every green head in the field appeared full of them. It was estimated that what ought to have given four to five good quarters of wheat (about 30 to 40 bushels) would not yield more than ten to twelve bushels per acre, and that of very inferior quality." During the same year the aphis swarmed, in Yorkshire, both on wheat and barley, doing much injury.

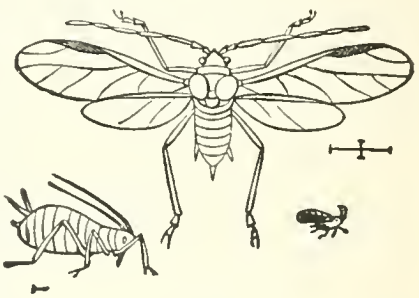


Fig. 27.

7. The Crane-Fly or Daddy Long-legs *(Tipula oleracea, etc.)*

is oftentimes a very destructive insect in England; several species are known in this country to commit much damage to grasses and crops. In 1878, near Dumfries, the larvæ of the crane-fly caused the worst insect attack of the season in the district. Hundreds of acres of corn (wheat) are mentioned as being completely destroyed. In 1879, at those spots in the same neighbourhood where it was so destructive in the previous year, it was scarcely noticeable, whilst in others in the same locality it was present to a most injurious extent. "According to report the worms had been counted at the rate of 12, and even up to 24, per square foot; and this insect is considered as without doubt the worst pest of the district." In Northumberland, Cheshire, Lancashire, and other localities, this insect was reported to be very injurious. The following account records an instance of a remarkabiy bad attack occurring in a fair-sized garden in the beginning of April, 1876. "The lawn was completely bared, and the larvæ were in such numbers that there was no difficulty in collecting them in barrowfuls; 57 larvæ were counted at one daisy root. Handpicking was useless, and a quantity of ducks were turned in, the soil being stirred into shallow furrows from time to time to allow them to reach their prey. Eventually the ravages ceased almost as suddenly as they had begun, but not until every piece of grass in the garden was bared, as if it had been cut with a turfing iron and left to die on the spot. Grass seeds were sown in the late spring, and their growth encouraged by a judicious use of nitrate of soda and dissolved bone manure. This soon restored the turf, and the *tipula* has hardly been noticeable since." "Looking at the partiality of *tipulæ* larvæ for damp ground, and that of the perfect crane-flies for rough neglected herbage, and their dislike to saline presence, it seems as if something might easily be done by draining, removal of lurking places, and dressing with chemical manures, at least to diminish this trouble, and the fondness of birds for the grubs shows a direct mode of destruc-

tion, whether by general encouragement of insectivora in the fields, or the more limited application available in the garden."

8. The Pear-Tree Slug Worm *(Selandria cerasi)*

is a very familiar insect in Canada, (fig. 28); though I cannot say that our species is identical with that found in England, *Eriocampa adumbrata*, it is at any rate very

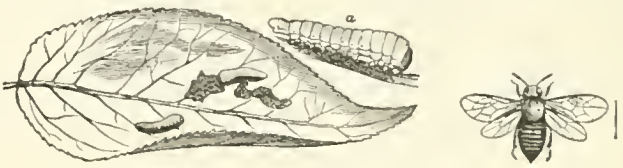


Fig. 28.

similar to it, both in appearance and habits. In 1878 this insect did much damage in the district round Dalkeith. "The easily applied remedies of a dusting of caustic lime, or a heavy syringing of the tree with strong soapsuds, are generally very effective in getting rid of this pest." A full account of this insect is given by Mr. Saunders in our Report for 1874.

9. The Gooseberry or Currant Saw-fly *(Nematus ribesii)*,

our well-known pest (fig. 29), is recorded as being very prevalent, both in 1878 and 1879. In this country we are able to keep it in check by the use of powdered white hellebore, and I have never heard of any ill effects being produced by the employment of this poison. A writer, however, relates that on one occasion "I dusted my bushes with white powdered hellebore, and ten days after (being dry weather from the time they were dusted) a tart was prepared of berries from these bushes. After partaking of the tart we all got seriously ill, but recovered, and next day we were all right. Since that period I never again made use of hellebore for destroying caterpillars on berry bushes. The remedy I have used ever since instead of hellebore, with equal success, is flour of sulphur. It is easily applied by dusting it over the bushes with a pepperbox while they are under the morning dew; or, if during dry weather, the bushes ought to be watered and then dusted. It is only necessary to dust the lower part of the bushes if taken in time. The use of sulphur is perfectly safe, and berries may be used at any time after its application."

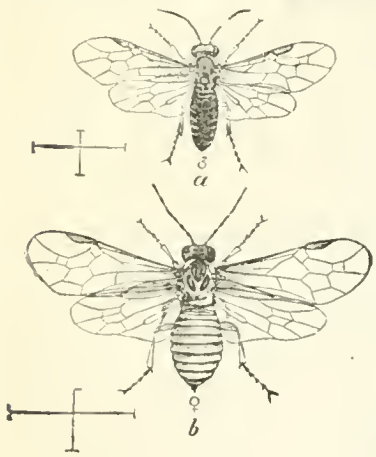


Figure 29.

10. The Asparagus Beetle *(Crioceris asparagi)*

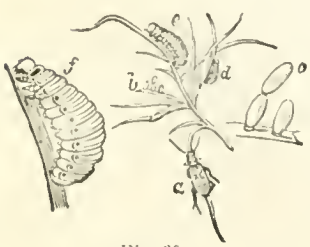


Fig. 30.

is an insect that has come over from England, and become very destructive on Long Island and in other parts of the State of New York. In fig. 30, this insect is shown in in its various stages. It is quite common, apparently, throughout England. The following remedies are set forth: — "The mixture consists of half a pound of soft-soap, quarter of a pound of flour of sulphur, and about the same quantity of soot, well mixed together in a pail of warm water. In this the infested shoots were dipped; and on inspection the next day it was found to have cleared the larvæ. The plants

were syringed afterwards with warm water (merely to clear off the dirt left by the dipping), and soon resumed a healthy appearance, and were thus saved from an unusually severe attack; the *Crioceris*, when brought under treatment, being present on almost all the plants and stems, and noticeable by thousands in the larval stage, as well as in the egg." Another writer states: "I stopped what was becoming a destructive attack by syringing the plants with warm water, just bearable to the hand; this sent off the larvæ, or loosened them so as to fall to a shake; and throwing soot liberally through the damp shoots to the ground destroyed the fallen grubs. This treatment, repeated once or twice in the course of the season, completely saved the plants, and the soot gave a luxuriant and healthy growth."

11. Insect Migrations.

The following account of an extraordinary migration of insects is so interesting that I need make no excuse for transcribing it here: "The swarm appears to have been composed, at most of the successive points noted, of the moth *Plusia gamma*, and of the painted lady butterfly, *Vanessa cardui*. It appears to have started from the north-west of Africa, and travelled in a north-east direction, was observed at Algiers about April 15th to 20th, 1879; it reached Valencia, and was spread over Spain, and also present in the Balearic Isles from April 26th to May 3rd, and crossed the Eastern Pyrenees on May 26th and 27th. It next appeared in the south-east of France, Switzerland and Northern Italy; and on the morning of June 5th, thousands of living specimens were found on the snow at the Hospice of St. Gothard. It was then distributed over Germany and Austria at dates of appearance noted as being from June 7th to 16th. Another column crossed the Mediterranean to Sicily, and spread northwards over Italy in June. The more westerly end of the migratory swarm reached Strasburg from June 3rd to 9th; Paris and its environs were apparently not reached till June 15th. The appearance on the south coast of England was noticed on June 10th; and the moths were subsequently observable throughout the three kingdoms. *Plusia gamma* was unusually abundant near Norwich on June 12th and 13th; and it was also noticed on the 13th in Essex. Subsequently it occurred in enormous quantities at many localities, the numbers, however, diminishing (as far as appears from the observations sent in) as the points of observation became more northerly. At Exeter, an observer states that he never saw anything to be compared with its numbers; towards the end of September the larvæ literally swarmed on every garden plant, defoliating the plants, as well as riddling the leaves. Another, writing from Chichester, mentions that serious injury was caused by the larvæ of *Plusia gamma* to the field peas, whole fields being stripped of their leaves, and the growth of the pods consequently checked. On August 5th great numbers of the larvæ were collected; two days later they spun up, the moths developing on the 14th, the pupal state thus lasting only a week or ten days. The moth was also noticed as unusually abundant in Buckinghamshire, Hampshire, Kent and in various other counties. "Before the appearance of the moth and caterpillar—it is noted—the sugar-beet crops in Saxony were in excellent condition, and would in ordinary circumstances have yielded a harvest of from nine to ten tons per acre; the actual yield where the caterpillars had been was only three tons."

A great many other insects are, of course, referred to in these interesting Reports, but the foregoing have been selected for notice here, inasmuch as they are more or less familiar to us on this side of the Atlantic. It would be an immense help to the effective study of practical entomology, and consequently of great value to the agriculturists and fruit growers of this country, if some similar plan could be carried out here. There would require to be one or more willing and competent observers in each county of the Province, who should note down particulars respecting a certain number of noxious insects, and send in their reports to some central office at the close of the season, making mention especially of any unusual depredations that might have occurred in their neighbourhood. By some such system as this we should get a large quantity of information that could easily be digested and put in proper shape for annual publication.

RHYNCHOPHORA—WEEVILS.

W. Hague Harrington, Ottawa.

The weevils are beetles belonging to that division of the *Coleoptera* known as *Tetramera* in the classification of early authors, and so distinguished because the beetles included in it have apparently only three-jointed tarsi or feet; the penultimate joint being so small and so closely connected to the preceding one as to be invisible without a magnifying glass. The greater number of these beetles can be readily separated from those of other families by their snouts or beaks, which in many species are so elongated and attenuated as to give their bearers somewhat of the appearance of lilliputian six-legged elephants. (See figure 31, which represents the apple curculio, *Anthonomus quadrigibbus*.) This well marked feature in their structure has gained for them their common name of "snout-beetles," and their scientific appellation of *Rhynchophora*, derived from the Greek, and signifying "beak-bearing." If we carefully examine one of these insects we will see that the head is lengthened into a proboscis, at the end of which are situated the mouth-parts, so reduced in size as to be almost invisible to the naked eye.

Fig. 31.

On the sides of the rostrum (to use the scientific name for this proboscis) are set the antennæ, usually slender and long; sharply geniculated or elbowed in many species, and commonly knobbed. They can be folded back so closely against the base of the snout, which is often grooved to contain them, as to be quite hidden. The beetles have hard, rounded bodies; some love the sunshine, others lie hidden all day and when night falls creep forth from their hiding places to continue their depredations, or fly about in search of new fields. The legs are often short and not well fitted for rapid progress, or for digging. Many have ample wings to carry them about, but in some species these useful appendages are wanting, or are so short as to be useless as organs of flight.

So far as known to me *all* the snout-beetles are vegetable feeders, and the great majority of them may be styled "obnoxious insects"; many being veritable pests to agriculturists and arboriculturists. They attack trees and plants of every kind and in every part; roots, stems, bark, twigs, pith, leaves, buds, flowers, fruits and seeds are all subject to the depredations of these long-headed foes, which, though minute, exist in such countless numbers as to make the total loss inflicted by them severely felt.

Weevils when young are short, fleshy, whitish grubs, without legs, and effecting what slight progress they require by the aid of their hunched segments, by the shape of which they may be easily known from the maggots of flies. Their heads are scaly or horny, and furnished with sharp mandibles to nibble the hard substances in which so many of them dwell, and in which they thus construct cells or short burrows. In these cells the majority of species pass also the pupa state, emerging only as fully developed beetles to spend a brief existence in the outer world. It is in the grub state that the weevil commits its depredations, for then it is invariably concealed in that part of the plant on which it subsists, secure despite its utter helplessness, and finding its proper nutriment in the walls of its prison. Trees are stunted and warped by having their young shoots devoured; fruit and nuts are caused to drop prematurely and decay; rice, corn, wheat and other cereals become mere empty husks, while peas, beans, and a great variety of seeds are destroyed by enemies so tiny that the hollowed shells form the house in which the full grown larva transforms to a perfect insect.

Our own weevils are inconspicuous both in size and colouring; in fact nearly all of them are small and dull looking beetles. In tropical countries, however, snout-beetles are found of very formidable dimensions, and some are most brilliantly marked and painted; of these I will mention a few examples presently.

The *Rhynchophora* are divided into two families, the *Bruchidæ* and the *Curculionidæ* (which unwieldy family has recently been subdivided into several smaller ones, but the

purposes of this paper will be equally as well served by adhering to the former classification). The great bulk of the weevils are included in the latter family, only some three hundred species of *Bruchidæ* being known, about fifty of which inhabit America north of Mexico. They derive their name on account of their nibbling or "biting" propensities. Their depredations are chiefly confined to the various members of the *Leguminosæ*—pod-bearing plants—and are marked among peas, beans and many seeds which among foreign nations and tribes are important articles of food or export. Figure 32 represents the well-known pea weevil (*Bruchus pisi*), both larva and beetle, magnified and of natural size, and figure 33 the American bean weevil (*Bruchus fabæ*).

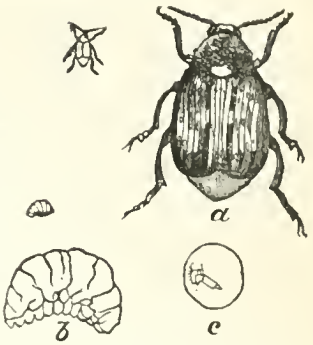


Fig. 32.

They are small active beetles, short and stout, of which the too-familiar pea-weevil is a good example, and are recognized by the manner in which the head is folded against the

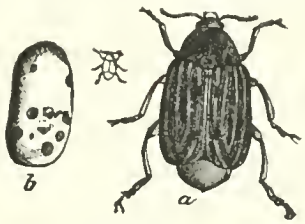


Fig. 33.

breast. The eleven-jointed antennæ are short and inserted close to the eyes. Some foreign species attain considerable size, one Australian fruit-eating species being considerably larger than our biggest weevil.

It seems almost superfluous to give any account of our pea-weevil (*Bruchus pisi*) after the able account of it by Mr. Saunders in the Annual Report for 1879, but as it is typical in structure and habits of this family I shall devote a few lines to it. Apparently a native of North America, it long since reached the southern portions of Europe, and is mentioned as having been so numerous in some districts of France in 1780 as to have seriously affected the health of the peasants who had partaken freely of the worm-infested peas. Mr. Curtis, in his admirable treatise on Farm Insects, written twenty years ago, expresses the hope that the climate of Great Britain will not suit the economy of this pest, and states that he has frequently found the beetles in imported peas.

The beetle is nearly oval in shape; from two to two and one-half lines in length and dull in colour, being black when divested of the dense covering of short hairs with which it is clothed. These hairs are rusty brown above and gray beneath, while the elytra (wing-covers) are marked by several white dots. The weevils pair in early summer when the pea-fields are in bloom, and as soon as the young pods are developed the female deposits her eggs thereon. A few days later the larvæ are hatched and eat their way into the nearest pea, in which they live usually until the next spring, when, having undergone all their changes, they come forth ready to attack the new crop. A method recently given by a correspondent of the *American Entomologist* to destroy the weevils in seed-peas is to immerse the latter for a few minutes before planting in a mixture of kerosene and water, which is said to effectually destroy the insects without injury to the peas. The following paragraph which appeared in a recent issue of the *Daily Globe*, contains a valuable suggestion as to the treatment of seed peas:—

"An entomological occurrence in The Globe office suggests an easy method of annihilating the pea weevil—an insect whose ravages are rapidly driving the farmers of some parts of Ontario to abandon pea culture in despair. A note in this column, a few weeks ago, about a new pea pest (not the weevil) brought half a dozen consignments of 'buggy

peas' with requests that the senders be informed whether their's was the new pest or the old one. The boxes containing the peas—which were all infested with the common weevil *Bruchus pisi*—were placed in a room which is somewhat over-supplied with steam pipes, and in which the temperature occasionally rises above 90 degrees. After a day or two in this room the regular transformation of the beetles from the pupa to the perfect state took place. On opening the boxes, they were found alive with weevils which had abandoned the holes in the peas, and were looking around for young pea pods in which to lay their eggs. In this lies the lesson. It is a pretty well settled fact in entomology that the function of egg-laying is not a voluntary one on the part of the female insect. Given the requisite temperature, and the process of egg-laying must go on whether the eggs be fertilized or not, or whether there be a proper place on which to lay them or not. It follows, almost to a certainty, that the pea weevil can be annihilated in a very simple manner. In the natural state the eggs of the weevil are laid on the outside of the young pea pods. The larva hatch out and burrow through the pods into the peas, one larva to each pea. Once there, they feed till they have attained their full growth, when they go into the pupa or chrysalis state. In the latter state they remain all the fall and winter. In the spring the weevilly peas are sown with the insect still in the pupa state. It remains underground till the soil has become warm, and then it changes to the perfect state, comes forth, and proceeds to perpetuate the species as before. Now, it appears from what happened to our consignments of pea bugs that the insects can be easily inveigled out of their holes during the winter when there are no green pea-pods for them to lay upon. Once out of the pupa state, it cannot go back again. If, then, farmers will during the winter place their seed peas in a warm room for a few days, the weevils may be brought out of their holes and killed, or left to die."

Bruchidæ from their habits are insects very liable to be carried from one country to another in the seeds used alike for food by man and weevil, and if the climate and food found in their new quarters be at all favourable, they quickly make themselves at home therein. As an example of the way in which such insects are imported it may be mentioned, that eight species were collected among foreign exhibits at the Centennial Exhibition.

The second division of the weevils is an enormous one, containing many hundred genera and many thousand species—the number of the latter named and described being 10,000 or more—while the list is being lengthened continually by the discovery of new ones, of which there must remain a great number, for a large proportion of the species are so small and inconspicuous as easily to escape early collectors in countries where many larger and more brilliant coleoptera can be easily obtained.

According to a recent "Check list of the Coleoptera of America north of Mexico," there are over eight hundred species, of which nearly half have been added within the last seven years. In Great Britain, where numerous collectors have thoroughly worked the ground, about five hundred species are known, and undoubtedly, when our own country has been more exhaustively searched, the Canadian list now numbering but little over one hundred forms, will be enormously swollen. I have obtained in the vicinity of this city over fifty kinds, some of which occur in large numbers.

Our snout-beetles are all small, many very minute; the largest is scarcely an inch long, while many are but one-twentieth of an inch. If then we consider the damage inflicted in this country, we can form some idea of the ravages that are wrought in more tropical countries where the weevils attain to a great size; compared to these our largest species are as sparrows to turkeys.

In Java is found an enormous black weevil, called *Protocerus colossus*, which measures three inches in length and is stout in proportion. With its immense front legs and strong, knobbed snout, it is a formidable looking beetle, and must do great harm to the trees on which it feeds. An allied Brazilian species is called *Rhina barbicornis* from its long hairy snout, which gives it a very fierce look. Some foreign weevils are as remarkable for their varied and brilliant colouring as for their size. The most commonly known is perhaps the diamond beetle of Brazil *(Entimus imperialis)* often used as a breast pin or similar ornament. It is a black insect, closely lined with rows of glittering green dots, and presents in its perfect state a magnificent appearance. A near relative of this beetle is *E.*

splendidus, clad in black bossed armour adorned with gold and green. A third species of these Brazilian gems—*Rhigus schuppellii*—wears a coat of green mail studded with golden knobs. Many other strangely formed or ornamented weevils are found in the south, of which but two examples can be given. The first is a large black beetle found in New Holland named *Gagatophorus Schonherri*. "There is scarcely any portion of the upper surface of this insect, which is quite smooth, those parts which are not knobbed being grooved. The upper part of the head has a wide and rather deep groove. The thorax is rounded and covered with knobs, which are comparatively scanty on the disc, but become very numerous and crowded on the sides. These projections are without any apparent order, but those of the elytra are arranged in three distinct rows. The elytra are very large and are turned over the sides rather abruptly. On the edge, where they are folded, is a row of nine knobs, so long and pointed that they may well be called spikes. Next comes a row of seven knobs, and next to the suture is a third row of four knobs, these last being placed rather irregularly (Wood's "Insects Abroad"). *Xenocerus lineatus* might well be mistaken for a longicorn beetle, so extraordinarily long are the antennæ of the male. The beetle is of a chocolate brown colour, marked with white lines, and is hardly an inch long, while its antennæ are more than two inches in length and very delicate.

Among our native weevils are two species belonging to the *Attelabidæ*. They are small beetles found upon the leaves of oak, etc., and are said to make a sort of little nest, in which to lay their eggs, by cutting and rolling up a portion of the leaf of some tree.

The largest weevil I know to be found in Canada is the one named *Ithycerus novaboracensis*. It is a stout-bodied beetle, from two to three-fourths of an inch in length; the largest ones (females) being one-fourth of an inch across the wing-covers. The snout is broad and the rather short club-tipped antennæ are inserted near the jaws. The thorax is short, about as wide as long, and marked by three longitudinal white lines. The elytra are wide and ample, being turned down well at the sides, and they are marked by parallel white lines, interrupted by slightly raised black spots. The colour of the beetle is black, but a scanty clothing of short white hairs gives it a grayish appearance. I have often found it during June upon beech trees, and the sexes copulate at this time. It is mentioned by Fitch as eating the buds and gnawing the twigs of apple trees in May and June.

Hylobius pales is one of the destructive weevils found upon our pine trees, and is very common throughout the lumbering districts. In Ottawa during the early summer they appear in great numbers, crawling on the sidewalks and on buildings and fences. Its length is about three-eighths of an inch, and its colour a deep brown, approaching almost to black. The rounded thorax is closely punctured, and the elytra have rows of impressed dots as if stitched, and also slight irregular markings made by white hairs, which in many specimens are rubbed off. The long snout is stout and strong, as are the legs, with which the beetle can cling tightly to its captor's finger, as it has a habit of doing, pressing at the same time with its snout, of which the mandibles are too small to pierce the skin. During May and June the beetle lays its eggs in holes bored in the bark of pine trees, and the grubs burrow between the wood and bark, loosening the latter and thus causing decay. I have found this beetle, early in May, with its snout buried in the base of the tube of the Mayflower (*Epigea repens*) in the same manner as bees perforate flowers to gather honey and pollen.

H. stupidus is a larger and heavier beetle, nearly half an inch long. The scutel is yellow, and there are scattered patches of hair of the same colour upon the body and wing-covers. It is much less numerous than the former species.

Pissodes strobi (fig. 35), the white-pine weevil, is smaller than the above described species, but is even more destructive in its habits. One of the most important uses to which our noble pines are adapted is for the construction of ships' masts and spars, for which purpose it is absolutely necessary that they be straight and faultless. Now, this weevil delights to select the leading or topmost shoot of the thrifty young pines, as the object of its attack. It bores holes in the bark, at irregular intervals, the whole length of the shoot; in each of these it lays an egg, and as soon as the larva is hatched, it eats downward toward the centre of the twig, and burrows in the pith. In the cell thus formed

Fig. 35.

it undergoes the necessary transformations, and emerges the following spring as the perfect beetle. For a month or two after the eggs are deposited, the growth of the shoot is unaffected, but as the grubs increase in size, and reach the centre, it begins to wilt and shortly dies and withers. One of the lateral or side shoots, curves upward frequently, and takes the place of the destroyed leader, but a crook is thus caused which greatly lessens the value of the tree. The only way to prevent their ravages, is by cutting off all the dead shoots, while the insects are still in them, and burning them. When these beetles are very numerous they also attack the side shoots.

There are other species of this genus, very similar in appearance to *P. strobi*, which are found assisting it in its ravages, and which are sometimes abundant.

Another weevil found upon pines, from the middle of May to the middle of June is *Polydrosus elegans*, which, as its name denotes, is a very graceful and beautiful beetle. It differs from the preceding species in shape, its body being narrow and more cylindrical, while the head is not prolonged into a slender snout, but is lengthened only slightly, and flattened, the mouth being wide, and having inserted near its sides the antennæ. The colour varies from a silvery gray to a creamy buff, and I have several specimens, usually males, of a most delicate glistening green. Their colouring is caused, not as in preceding species, by a covering of short hairs, but by a coating of minute iridescent scales, resembling in shape grains of rice. When denuded of these fragile scales, which are easily rubbed off, the beetle is jet black.

The numbers of the genus *Anthonomus* are, as indicated by the name, "flower-dwellers," and are found upon trees or plants when in blossom, and as the fruit is setting. Several species occur in Canada, one of which, *A. quadrigibbus* (see fig 31), is a small, rough, robust beetle of a reddish brown, with a slender beak almost as long as its body. It is often abundant upon the hawthorn, and when disturbed folds its legs, tucks carefully away its antennæ, and looking for all the world like a withered bud, drops to the ground. This habit of simulating death and of taking on the appearance of a dried bud, seed, or bit of moss or dirt, is common to many weevils. The little beetle in question is sometimes called the apple weevil, because it punctures that fruit at times, with from one to twenty holes.

An allied species, *A. suturalis*, the cranberry weevil, is a minute reddish weevil, which in the United States attacks the cranberry vines, and, as it is found in Canada, may probably do so here also, although I have seen no record of its operations. The female is said to bore a hole in a bud, and after depositing an egg therein, cut it off, so that it falls upon the ground and decays, while the grub grows and transforms within it.

Conotrachelus nenuphar, the plum weevil, is too well known (especially after the full account of it by Mr. Gott, in last year's Report), to require more than a brief mention here. In fig. 36 we have this insect shown in its several stages of larva, chrysalis and beetle.

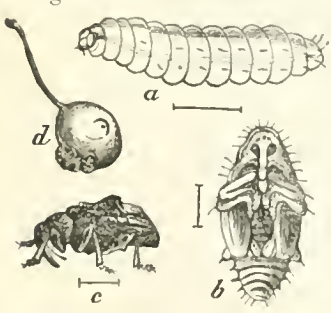


Fig. 36.

From its extended ravages, and the crescent-shaped mark which it makes when depositing its egg in the young plum, it has been, not inappropriately, named the "little Turk." The grub, when hatched, eats towards the germ of the fruit, which then dies and falls prematurely to the earth, where it is kept moist while the worm attains its full growth. When arrived at maturity, the grub leaves its wasted larder, to pupate in the earth, from which it emerges the following spring, as a small, rough, dark, mottled beetle. Jarring the trees once or twice daily, during the season when the beetles are depositing their eggs (that is when the plums have reached the size of peas), and thus causing them to fall down upon sheets spread beneath the trees, is apparently the best method of exterminating this pest, which is spreading rapidly throughout the country, and destroying great quantities of fruit. Various other plans are however advocated, for the best of which I will refer you to Mr. Gott's report.

The plum weevil when abundant also attacks other fruit; including apples, pears, peaches, apricots, nectarines and quinces in its list of dainties. It causes some to fall prematurely, and mutilates and scars many others, so as to render them unfit for market.

Plums are not largely grown in this vicinity, but at several places in the woods where trees are growing wild (in abandoned clearings, etc.), I have found this beetle, and in such places it is left to increase unmolested, and is secured against extermination.

The plum weevil has been accused of causing the disease on trees, known as "black knot," but although the grubs are sometimes found in these excrescences, they are not the cause of the injury, but only an accidental result of it, the beetle having been deceived into depositing its eggs in the swelling part when green and soft. Farther south, where the beetle is double-brooded, it has been said to deposit its eggs in the bark of young pear limbs, the grubs which winter therein accounting for the spring brood. The plum-gouger, *Anthonomus prunicidae* (fig. 37), is also destructive to plums.

Fig. 37.

There are other species of this genus found in Canada, but none are so notorious.

Tyloderma fragariæ is a small weevil that (across the line if not in this country) attacks the strawberry, and is known as the "strawberry-crown borer," because it destroys the embryo fruit stalks and leaves in the crown of the plant. (See fig. 38, where the larva and beetle are both shown.) An insect with such a disposition may readily become a serious enemy to small-fruit growers.

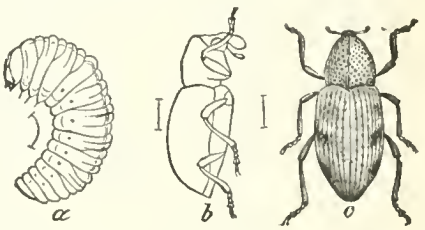


Fig. 38.

Mononychus vulpeculus is a robust beetle slightly larger than the pea weevil, but differing from it in shape. The body is about as wide as long and very thick; the thorax is much narrower, while the head is small and the snout long and fine. The beetle is black above, and of a rusty yellow beneath. The grub lives in the pods of the common flag, or iris, eating through two or three seeds (which it leaves mere rings) and forming a cell in which it undergoes its changes. They are often very plentiful and scarcely a pod escapes, but, of course, the greater part of the seeds in the pod are uninjured. On the first of August last, in passing through a field of these plants, I noticed that some pods had an appearance of some internal disease, and on investigation found the source of trouble to be a small white grub, evidently a curculio larva. Aware that a weevil did infest these plants, and not having hitherto bred any specimens, I carried away a pocketful of pods for the purpose of so doing. These were placed in a small box, and not looked at again until the 19th of September, when on emptying the box I found nine specimens of *M. vulpeculus*. There were also two small moths and six ichneumon flies, four of the latter being females and two males. On opening the pods I obtained nineteen more weevils and four ichneumons, as well as two larvæ of the moth. Hardly a pod was without a tenant, while in some dwelt two or three. A day or two later I visited the patch where I obtained the pods, and found that with few exceptions the pods had burst and scattered their contents, but a few remained, and either showed holes through which insects had escaped or still contained weevils or caterpillars. The beetles probably spend the winter underground or concealed in the dead plants.

As shown by the figures above given, fully twenty-five per cent. of the insects were destroyed by the ichneumons. In the same way the plum weevil has been greatly checked in some places by an ichneumon fly called *Sigalphus curculionis* (fig. 39), which is very similar in size and appearance to the ichneumon just mentioned as parasitic on the iris-weevil.

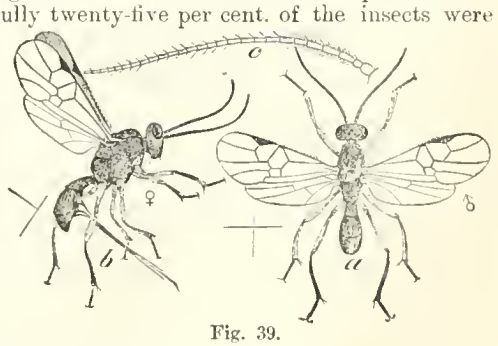


Fig. 39.

A weevil remarkable for its long slender rostrum or snout is found upon hazel-bushes in May, and more abundantly in June, about the middle of which month the beetles are frequently seen paired. It is

called *Balaninus nascicus*, the specific name being conferred on account of its snout or "nose," which, though no thicker than a bristle, is nearly as long as the body, and carries a pair of long and very delicate antennæ. The beetle is a third of an inch long, with an oval body covered with short yellow hairs. The grub lives in the hazel-nut, but leaves it when full grown to transform in the ground. In 1879 the nut crop was large and these beetles were very abundant, but last summer there were but few nuts and I only observed one weevil. This beetle, according to Fitch, also feeds on hickory nuts, and *B. rectus*, distinguished by the beak being shorter and straighter, attacks acorns. This genus, I may add, derives its name—*Balaninus*—from a Greek word signifying acorn.

Remarkable as our nut weevil is for its long, slender nose, it is far surpassed by an African beetle which has a bristle-like snout fully three times as long as its body, the latter being half an inch in length.

Cratoparis lunatus is not an injurious weevil, for, unlike the majority of its kind, it forsakes sweet flowers and succulent fruits to feast upon dry fungus, such as grows upon old beech trees. It is about a third of an inch long and of a mottled colour, exactly resembling when disturbed a bit of fungus or moss.

The members of the small group *Brenthidæ* are easily distinguished from other weevils by their remarkably long bodies, snouts not bent downwards or curved, but stretched straight out in front, and unelbowed antennæ. The only Canadian species is *Arrhenodes Septentrionis* (Hbst.), the larva of which lives in hardwood trees (most frequently oak), not only in dead trees but in living ones. The female is said to bore a hole in the bark with her long snout, and shove into the puncture an egg. The cylindrical, whitish grub bores a round hole through the bark and into the solid wood of the tree. It is a slender worm, an inch or over in length, and little more than one-tenth in diameter; changing in its burrow to a yellowish white pupa.

The beetle has a cylindrical body attached to which is an egg-shaped thorax, rounded off where it is joined to the body, and tapering gradually to the head, which is prolonged in a straight snout, hardly as long as the thorax. The snout of the female is very slender, and the jaws at the tip are so small as to be barely visible to the naked eye; that of the male is much heavier, and the jaws are strong and curved. The antennæ of the female are inserted at the base of the rostrum near the eyes, while those of the other sex are set midway between the eyes and mouth. The general colour of this beetle is a rich brown; it is very smooth and glossy, with the exception of the wing-covers, which are striated, punctured and marked with irregular, broken, yellow lines. These beetles may be taken in June among oak trees, or more readily in lumber yards among newly sawn oak lumber. I have also taken several which were attracted with other species of weevils to a bright light placed to allure moths. They vary wonderfully in size, the males (an unusual thing with insects) being largest. Ordinary specimens are from four-eighths to five-eighths of an inch long and about one-eighth in diameter, but Fitch mentions one as being only two-eighths long, and I have an enormous male, a giant of his race, measuring over seven-eighths. It is proportionately stout; the rostrum is very broad and strong, and the jaws large and powerful. It was found last summer in a cleft of a newly fallen butternut tree.

The *Calandridæ* embrace many highly destructive insects. In the West Indies is found an enormous weevil which injures palm trees and sugar-canes. Its gigantic white grubs are called by the negroes "gru-gru," and by them, as well as by many white people, are considered a very great delicacy, although those not accustomed to such unusual dainties would consider them a very distasteful kind of grub.

Our northern species are small but still capable of doing immense damage by their united efforts, and the grain weevils have a world-wide notoriety on account of their ravages. Three species of the latter are common in the States, viz:—*Calandra oryzæ, C. granaria, and C. remote-punctata;* the two last are also found in Canada. *C. oryzæ*—the rice weevil—is supposed to have spread westward from the East Indies with the grain from which it derives its name. Unfortunately, however, it does not confine itself to rice, and at the Philadelphia Exhibition was found to abound in rice, maize, and wheat from all parts of the world.

With the aid of its relative the granary weevil (*C. granaria*)—see fig. 34—it destroys vast quantities of stored grain. Curtis says that no insects in England do more mischief to

stored grain than these two weevils introduced from abroad. In warm countries, such as those of southern Europe, there are many broods during the year, and the loss caused is correspondingly great. The beetles penetrate some distance into the heap of grain; the female lays her eggs singly in the grains, and in a few months there remains nothing but a heap of empty husks, tenanted by grubs and beetles. At an entomological meeting in England, April 1870, it was stated that 74 tons of Spanish wheat when sifted yielded *over half a ton of weevils*, and 145 tons of American grain gave *one and three-quarter tons*. Fortunately these beetles do not thrive without heat, and cannot carry on their depredations in the cold of our winter, hence grain can be stored here for many months without loss.

The *Apionidæ* are a group of small pear-shaped weevils the minute larvæ of which infest different seeds.

Besides these we might mention as destructive the quince curculio (figure 40), *Conotrachelus cratægi*, which is injurious to quinces; the imbricated snout beetle, *Epicærus*

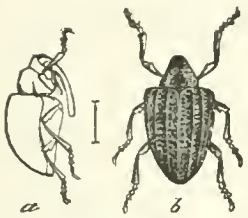


Fig. 40.

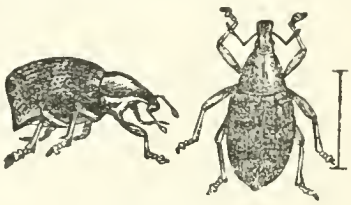


Fig. 41.

imbricatus (figure 41), which injures apple and cherry trees by gnawing the twigs and fruit; the corn sphenophorus, *Sphenophorus zeæ* (figure 42), which damages the corn crop

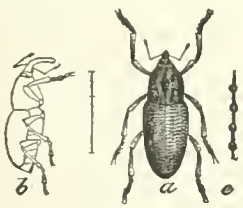


Fig. 42.

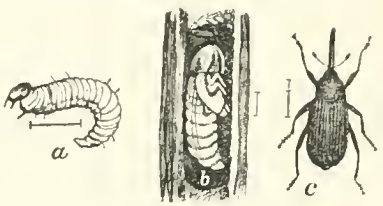


Fig. 43.

and the potato-stalk weevil, *Baridius trinotatus* (figure 43), which injures the potato.

This paper has already reached such a length as to exclude further descriptions of our weevils, species of which will from time to time be found coming into notoriety through attacks on our trees or plants. Even those now only to be met with feeding on wild plants may some day transfer their affections to a cultivated one, as has frequently been the case hitherto. Occasionally also new species may be brought into the country with imported seeds and plants. The *American Entomologist* recently warned importers of fruit plants from England to be on their guard against introducing a weevil, which has of late years been very destructive to raspberry bushes, as it would, doubtless, flourish here, there being several closely allied species already in this country.

The name of this possible visitor and dreaded foe is *Otiorhynchus picipes*, and in its native land it attacks a great variety of plants and trees, such as peas, beans, turnips, elms, lime trees, etc. The principal damage appears to be done by the full-grown weevils, which are wingless and night feeders, hiding during the day in crevices or under bark, stones, etc. They are "sometimes a dreadful pest in gardens, committing sad ravages on vines in hot-houses and on wall fruit, during the night. They likewise injure raspberry plants in spring by eating through the flowering stems and leaves, and they nibble off the bark and eat out the buds of apple and pear trees." The larvæ live in the roots of flowers and other plants, and are very destructive to them.

The ravages of weevils cannot be stayed by the same measures which avail in the case of the potato beetle and other leaf-feeding larvæ. Their grubs cannot be reached by Paris green and similar poisons; their destruction can only be accomplished by that of the substance in which they feed concealed. Failing then to reach the grubs, it remains to attack the beetles themselves, and this is often difficult of accomplishment, on account of their secluded habits and the trouble of finding them. They are also exceedingly tough subjects to kill; their hard bodies are capable of resisting much hard usage, and, to a great extent, the action of such substances as are all-powerful in the destruction of insects endowed with less vitality.

I have frequently kept plum weevils for hours, sometimes for a couple of days, in a cyanide bottle, which would kill most insects in a few minutes, and although stupefied, they would, in a short time after liberation, be as lively as ever. They are indifferent to the most powerful and offensive odours, and decoctions of tobacco, soap and lime, that easily repel most insects, are apparently but little hurtful to them.

To show the tenacity of life in snout beetles, an English entomologist mentions a curculio (of genus *Cleonus*) which, after resisting the action of laurel leaves, which are used in collecting-bottles as poison, was twice immersed in benzine, the second time for a whole night, and finally had to be killed with hot water. Another instance is where some weevils lived in and devoured coriander seed, among which were pieces of caustic stone.

One simple way to prevent the ravages of weevils is to see that all seeds are thoroughly freed from them before planting, and likewise in setting out plants or trees to observe the same precautions. Yet, sooner or later, they will find their way from adjacent fields, or even distant counties, and then resort must be had to warlike measures. Some species, such as the plum weevil, may be jarred or shaken upon sheets, or frames covered with cotton; others may be taken (some by day, some by night) with sweeping or beating nets. The best way to kill the captured ones is to put them in boiling water.

Fruits or nuts, which have fallen to the ground, should be carefully collected and destroyed before the larvæ therein have left them and entered the earth, and all substances under which the beetles might hide should be removed.

Twigs and canes infested should be cut off and burned in the autumn, or in spring before the beetles have emerged.

Powdered pyrethrum will be found very effectual in destroying weevils among such seeds as peas and beans, if dusted over them, and if well sprinkled among heaps of grain is said to thoroughly kill off the grain weevils.

But little assistance is received from birds toward exterminating weevils. Many species are concealed all day in crevices, under stones, etc., or even beneath the surface of the ground, and only come forth when the birds have ended their labours. Others so closely simulate bits of moss or dirt, or the colour of the bark or other part of the plant on which they rest, as to be safe even from the sharp eyes of our feathered friends. Nearly all are so timid that when alarmed or disturbed they fold up their antennæ and legs and drop to the ground, where they are almost invisible. The stray weevils occasionally captured by birds are not very satisfying morsels, being chiefly hard, horny shell, while the grubs, which are soft and fat, are generally secure in their cells or burrows.

ON THE CHIEF BENEFITS DERIVED BY FARMERS AND HORTICULTURISTS FROM A KNOWLEDGE OF ENTOMOLOGY.

By James Fletcher, Ottawa, Ont.

"Well! what's the use of all your bug-catching and long names to me?" is a question which in this essentially utilitarian age the entomologist has too often to answer farmers and horticulturists even here in fair Canada, where the unparalleled climate presents most

favourable conditions not only for the successful cultivation of roots, cereals, fruit and the other varied forms of produce which constitute the wealth of the agricultural classes, but also for those gigantic armies which from time to time levy such undue tribute upon their hard-earned savings, and where consequently it might be imagined they had been taught a practical answer by bitter experience. But no! such is not the case, and these "minims of creations" individually so puny and weak, but which, united, form such irresistible forces, are to-day very little more studied by the people most concerned than they were fifty years ago. The answer to the question is simply this, "To enable you to know your friends from your foes." I shall endeavour to show that everything which is generally designated by that expressive word "bug" is not an enemy which must be executed at once without a trial. It cannot but be a matter of considerable surprise to any person who turns his attention to the study of Entomology to find to what an extent, comparatively speaking, that branch of Natural Science is neglected by scientific men, for notwithstanding the large sums of money devoted yearly by wise governments towards its encouragement, and the untiring efforts made by individual students to present it to the masses in a popular form it must be acknowledged that as yet it is not studied nearly as much as it deserves.

Little attention was paid to Natural History previous to the commencement of the last century, although the writings of some of the leading philosophers of antiquity show that it was considered of sufficient importance to receive special study. Aristotle and Pliny the elder wrote of insects largely, although, it is true, somewhat erroneously at times. They too often fell into that trap which is still set in the path of modern investigators, namely, allowing their imaginations to carry them away from the truth to build up a previously conceived theory. There are not many of whom it can be said as of Dr. Leidy, "the most distinguished naturalist of America," as follows:—"In the performance of his scientific work he has confined himself to the duty of accurately describing what he has seen. He very rarely draws inferences from his accumulated facts, and his innate truthfulness is such as to deter him from theorizing."*

The first book published in England upon insects alone is said to have been Mouffet's "Theatrum Insectorum," which appeared in the reign of Charles I, after having passed through the hands of five learned doctors, all of whom did something towards its completion, and after having taken about 100 years to finish. It was owing to the efforts of Ray and Linné, ably assisted by the their contemporaries Reaumer and DeGeer, that Entomology was raised to its proper place among the sciences. Since their time many learned men have fought hard to keep it there, until now "the laugh at Entomology is nearly spent, and known professors of the science may meet in open conclave to exchange observations without fear of becoming subjects for a commission *de lunatico inquirendo*, and may now, net in hand, chase their game without themselves being made game of."† This, however, was not the case in the last century, for we are told in Kirby and Spence's "Introduction to Entomology" that an attempt was made to set aside the will of a rational woman (Lady Glanville) on the ground of insanity, which was evinced, it was claimed, by her fondness for collecting insects.

Foremost of all the great powers in the prosecution of scientific research is undoubtedly the Government of the United States. No expense or trouble is deemed too much, but whatever advantage energy and perseverance can gain for the general good they secure. Their official publications upon scientific matters are simply magnificent, and the generosity with which they distribute them to institutions and societies, where they can be freely consulted, are as proverbial as the politeness of the gentlemen entrusted with the investigations which are thus recorded. No one ever need be at a loss for information upon any ordinary scientific point, for on writing to the Department in Washington which considers that matter, he will receive an answer by the return mail.

By means of the generous assistance of our own Government, our Entomological Society of Ontario is able to put in the hands of all the agriculturists of the Province

* Popular Science Monthly, vol. xvii., p. 691.
† Episodes of Insect Life.

information with which, at any rate it is hoped, they can fight most of the insect pests from which we occasionally suffer, and also at the same time learn to discriminate which among the countless hordes of the insect world may be ranked as allies.

The naturalist founds his studies upon the theory that nothing in nature is useless, and everything that is, must have some special function to perform or it would not exist; it is in tracing up these special adaptations to certain ends that he finds the charm which enables him to carry on the laborious investigations which are oftentimes necessary.

As every one knows, vegetable and animal life are the two re-agents which Nature employs to keep up the balance of creation, the one feeding upon or deriving its nutriment from the other. Now, these two agents are to a certain extent acted upon and kept in check by their own component parts. Whenever, owing to particularly favourable circumstances, too many seeds of any one species of plant spring up in the same place, they do not all mature, for if they did, all would be sickly from want of light and air, and the species would gradually degenerate. Consequently, it is provided that the weaker should be kept down and choked to death to make room for their more robust companions. This is similarly the case in the animal world, as for instance with insects. When, from special circumstances, any one species is abnormally multiplied, it is sure to be attacked and kept in check by some other kind, which itself may be a prey to another species. Plants through all their stages from the seed to the decaying leaf, are the original source of support to some form of animal life; wherever vegetable life is profuse, there insects abound. The green plant attracts innumerable small insects; these in their turn attract larger carnivorous species, which are again preyed upon by birds and reptiles, and the larger carnivorous animals follow. The flesh feeders, thus depending one upon the other for subsistence, have a primary dependence upon vegetable life; therefore, wherever there is the greatest variety of vegetable life there will necessarily be the greatest variety of animals, whether quadrupeds, birds, reptiles or insects.

It is estimated that insects comprise no less than four-fifths of the whole animal kingdom. While there are about 55,000 known species of animals, excluding insects, the number of these amounts to upwards of 200,000. It is therefore perfectly manifest that they must perform some very important mission in the economy of nature. "It would be easy," writes the Rev. J. G. Wood in "Insects Abroad," "to show how the very creatures which are most detested by man, and do him the most direct damage, are indeed, though indirectly, among his best benefactors. Apart from direct benefit or injury to man, the whole of the insect tribes are working towards one purpose, namely, the gradual development of the earth and its resources. The greater number are perpetually destroying that which is effete, in order to make way for something better; while others, whose business seems chiefly to be the killing and eating of their fellow-insects, act as a check to their inordinate increase, and so guard against the danger of their exceeding their proper mission."

I will borrow from the same author two more similes demonstrative of the fact that even amongst those insects which we consider most noxious we have some good friends. What more annoying creature can the mind conceive than the common mosquito? Truly is Beelzebub ("King of the Flies") rightly named if these are types of his subjects. It must be remembered, however, that devouring human beings is not the normal occupation of mosquitoes; but the former are intruders into their domains, and consequently must bear the consequences. Their real object is a beneficent one. In the deep dark forests of the tropics the air would be perfectly stagnant, and an enormous development of noisome fevers would be the consequence, if it were not for the motion caused by the wings of these minute creatures which breed there in myriads, and that of various birds and predacious insects which they attract there to feed upon them. In the larval state, too, they live in water, and feed upon the particles of decayed matter which are too small to be noticed by the larger aquatic animals. Were it not for the presence of these insects, which swarm in vast armies in all stagnant water in warm climates, thus purifying it as well as the atmosphere, such localities would be uninhabitable by any animals higher than reptiles. Again, strange as it may appear at first sight, if it were not for the existence of the many borers and wood-eating insects we could have none of those

lovely forests which give so much beauty to our landscapes, and are the source of so much wealth to the country. Let us imagine that all these insects have been destroyed at one fell swoop, and note the consequence. A giant of the forest dies, and in course of time, during some winter storm, is blown down. Where it falls there it lies, and nothing can grow from the space which it covers. Time rolls on and tree after tree falls, until the whole ground is covered with the trunks and limbs of fallen trees, and what was once a stately forest, with all its wealth of life, is now a vast wilderness where nothing can grow. How different is the beneficent operation of Nature under the present conditions; Scarcely has a tree shown signs of declining vigour than the insect hosts are at work. First of all come certain species which pick out any weak point and deposit their eggs there. The larvæ in due time hatch, and, eating into the tree, accelerate its decay. When it dies and falls to the ground it is immediately pounced upon by the large wood-boring beetles, which deposit their eggs upon the bark; these hatch into grubs armed with strong jaws with which they soon bore into and through the trunk, thus rendering it permeable to air and moisture. Smaller beetles and other insects follow in the wake of the larger, and bore out the softened decaying wood, some using it as food, others as materials for their nests. The rapidity of the work of destruction is astonishing, and, in an incredibly short time, the giant which had taken hundreds of years to mature is reduced to mere dust, which serves as a fertilizer of the soil, and enables it to produce fresh trees to fill up the gap left by the one which has gone.

It is questionable whether any good results would follow from giving statistics of the amount of damage done by insects at different times, for so enormous are the figures that could they even be appreciated they would not be believed by those who do not make a study of the matter. It was estimated by Mr. B. D. Walsh, a careful observer, that in 1861 the injury caused by insects in the State of Illinois alone amounted to twenty million dollars, and that the damage done by insects in the United States cannot be less than three hundred million dollars annually.

It may not be out of place here to say a few words with reference to scientific nomenclature. There appear very frequently in the different newspapers accounts of the depredations of insects, and, that these may be concise and explicit, it is absolutely necessary that some of the technical terms of Entomology should be used. But this is not pleasing to all the agricultural classes, "for," say they, "how do we know what such terms as hymenopterous, coleopterous, or dipterous, insects, which so frequently occur, mean?" True! as a rule they do not; but if they take an interest in their own affairs, they should make a point of finding out what they mean ; no one suffers more from these hosts than they do, and it is ridiculous to think that they will remain inactive spectators when it is within their power to avert or at any rate to palliate the evil, by taking cognizance of and following the instructions given in the records of the work done by entomologists. And what does all they are asked to do amount to? Simply this, that they will learn the meaning of about at the most a score, certainly not more, of classical words. Now, let us consider what would be the result of their taking this trouble. In the first place Entomologists could write short and concise accounts, intelligible to all, and, much more important still, these accounts would not only be read and profited by, but the farmers, necessarily taking an interest in what touched them so nearly, would also communicate many of their own observations which, isolated, were useless, but being brought to the notice of one who made a methodical study of the life-histories of insects, might form a connecting link of the utmost importance in a previously broken chain of observation, on a certain insect. These observations, too, being properly expressed, could be relied on, and no confusion could arise which would decidedly not be the case unless the proper terms were employed. Curtis, in his "Farm Insects," expresses himself as follows: "It is a great mistake to suppose that scientific descriptions and correct nomenclature ought to be employed for the use of those only who are specially engaged in the study of Natural History. If insects be not thus accurately described, and their names learned carefully, the facts noticed by practical observers are generally worthless, and may tend to mislead, by the confusion of one species with another, and the consequent adoption of improper remedies. It is thus that I have found, in extensive reading on these subjects, that a very

large amount of the information given by practical agriculturists and gardeners has proved valueless in cases where, if the particular species alluded to could only have been identified, it would have been of the greatest value in furthering subsequent investigations."

But why, it may be asked, use Latin and Greek, why not use English? Firstly, because English is not spoken in all parts of the globe, while Latin and Greek are the universal languages of the learned in all countries, and secondly, because the very nature of these languages particularly adapts them for the purpose. In Natural History it is frequently necessary to distinguish very different and very approximate forms, and it is of the greatest importance that the differences perceptible to the eye should be explained by precise terms in a concise and readily understood language, and Latin has been unanimously chosen by scientific men. When, however, as is occasionally the case, that tongue is deficient in a characteristic expression, the example of the early writers is followed and application is made to the Greek, which, from the euphony of its words and the fulness of its tones, is well adapted to the construction of permanent names of orders and genera.

There has been great difference of opinion among entomologists as to what orders in the animal world the class INSECTA should include, and perhaps even more upon the division of these orders into sub-orders. As Dr. Packard's "Guide to the Study of Insects" is the only manual we have here, it will be well to follow the plan there presented in drawing a short sketch of the class.

Insects are divided into three orders :—

1. Hexapoda,

or true insects, which have six legs, and attain the perfect state, in which they generally possess wings, through a series of stages of existence, or metamorphoses, known by the names of the egg, the larva or caterpillar, the pupa or chrysalis, and the imago or perfect insect. Upon examining the body of a perfect insect, it will be seen that the portions of the body are more distinctly separated than they were during its earlier stages, and that now the segments of the body are collected into three chief regions,—the head, the thorax, and the abdomen. It is from this division of the body that the word insect is derived. Aristotle called insects ἔντομα, from ἐντέμνειν = to *cut in*, and the Roman writers, following him, called them *insecta*, from *insecare*, which also means to *cut in*, and this name has been adopted by all later authors.

2. Arachnida,

or spiders, which have the segments of the body grouped into two regions, and have eight legs, but no wings; they pass through no metamorphoses, but grow by frequent moultings of the skin.

3. Myriapoda,

or centipedes, which have the body worm-like, without wings, and the segments not grouped into regions (except in the newly hatched young), have no metamorphoses, and grow by the development of additional rings to the body.

We will turn our attention to the first of these orders. The true insects are divided up into seven sub-orders, according to the structure of their wings, and these again are grouped together into two series, according to their relative rank and affinities. The first and higher series have the body usually cylindrical, mouth parts more generally formed for sucking, metamorphoses complete, larva usually cylindrical very unlike the adult. The sub-orders embraced by this series are Hymenoptera, Lepidoptera, and Diptera.

In fig. 44, we have a representative of the Hymenoptera in the common blue digger

Fig. 44.

wasp (*Chlorion cæruleum*). Fig. 45 shows one of our butterflies, *Papilio turnus*, a

Fig. 45.

familiar species, belonging to the Lepidoptera, while the Diptera are illustrated by the red-

Fig. 46.

tailed tachina fly (*Exorista leucaniæ*), fig. 46.

The second, and lower series, have, usually, the body flattened, mouth parts adapted for biting, metamorphoses complete, larva flattened and often resembling the adult, and comprises Coleoptera, Hemiptera, Orthoptera, and Neuroptera.

A familiar example of the Coleoptera is given in the Cylindrical Orthosoma (*Orthosoma*

Fig. 47.

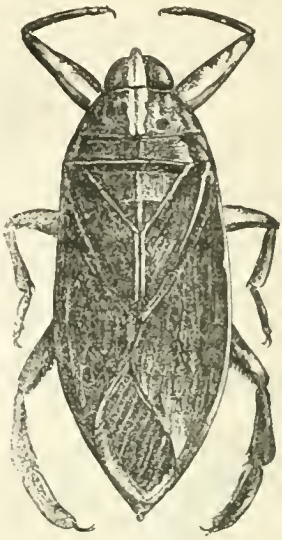


Fig. 48.

cylindricum), fig. 47, one of our most abundant longicorn beetles, the Hemiptera are

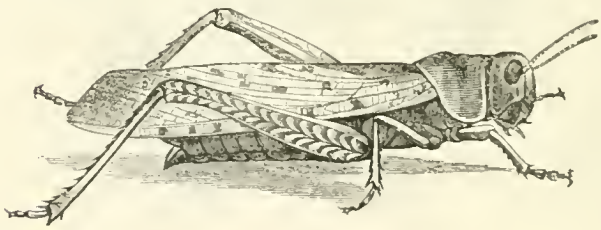


Fig. 49.

represented by a large water bug (*Belostoma grandis*), fig. 48; the Orthoptera, in fig. 49, by

Fig. 50.

a common grasshopper, or locust; and the Neuroptera by a dragon-fly (*Libellula trimaculata*), fig. 50.

The three regions into which the segments of the six-legged insects are grouped, are known by the names of the head, the thorax and the abdomen. *The head* carries the special sense organs, as the eyes, the mouth and the antennæ. The eyes are wonderful structures, and are constructed to cover a very large field of vision; they consist, first of all, of two large compound eyes, made up of numerous small six-sided facettes, which are so numerous that Leeuwenhoec is said to have counted as many as 8000 in the eye of a fly, and Strauss 8820 in that of a cockroach; besides these two compound eyes, there are in many insects two or more simple eyes (*ocelli*) arranged across the forehead, they can be easily seen in the common Humble Bee. There are some insects which have only *ocelli* and even some with no eyes at all.

The principal organs of the mouth are six in number, two on each side of the opening, one above and one below, arranged thus ⋮ ⋮ ⋮, the upper single organ is the upper lip or *labrum*, the lower the *labium* or lower lip, this lower lip has a basal joint (*mentum*) supporting a more flexible part (*ligula*); the upper or inner integument of the *ligula* is usually developed into a kind of tongue, which is a distinct part (*lingua*) in the locusts and dragon flies; the superior pair of the lateral organs are the upper jaws or mandibles, which are generally hard and serve to tear the food, the inferior pair are the lower jaws or maxillæ, which are generally soft and serve to to carry the food to the gullet, to be swallowed. To the lower jaws and under lip are attached short jointed processes, called *palpi* or feelers. These oral organs are the same in all insects, although the structure is vastly different among those which obtain their food by mastication and those which obtain it by suction; by dissection and comparative anatomy however it can be shown that they are identical, only greatly modified in form, in both of these classes. In biting insects, as beetles, the side pieces are short, far apart, and have a horizontal motion, and the upper lip is a flat plate closing the mouth above; with sucking insects as mosquitoes, the same parts are elongated into lancet-like organs, are close together, and have a longitudinal motion, and the lower lip at the same time is developed into a tube, which incloses them. In Lepidoptera the three upper organs are very feebly developed, while the maxillæ are elongated into a delicate proboscis, the identification of which with the maxillæ is shown by the occasional presence at its base of a pair of minute palpi; the lower lip is soldered to the head, but is furnished with a pair of palpi, well developed and clothed with scales, which act as a protection to the proboscis. In the flea the middle lancet seems to represent the upper lip.

In bees the lower lip and maxillæ form together a sucking apparatus, but they are also provided with well developed upper jaws or mandibles.

In the front part of the face of an insect are two appendages, which vary very much in form, in the different sub-orders and genera, and even in the sexes of one species; they are called antennæ. What the exact functions are of these important organs, is not known, but it is probable they have more uses than one. Experiments have been made with moths in which it was observed that if the antennæ were removed the insect seemed unable to direct its flight. It is probable too that the olfactory nerve is situated in the antennæ. The different forms which the antennæ take have been made use of by entomologists in classifying insects.

The next division of the body of an insect is the *thorax*. This is the solid portion which bears the organs of locomotion, and comprises the three segments which follow the head. The first one is called the pro-thorax and bears the first pair of legs, the next or middle segment is called the meso-thorax and supports the second pair of legs and the anterior pair of wings, the third segment is called the meta-thorax, and to it are attached the third pair of legs and the hind wings. The wings are objects of great beauty and strength, and consists as a rule of a double membranaceous plate, traversed by more or less bony veins.

The last division of an insect's body is the *abdomen*, which consists of a series of segments attached by membranes. Each of these segments is formed of two arcs or semi-segments, one above and the other below. The abdomen is the seat of the organs of reproduction and alimentation. The senses of insects are dependent upon the nervous system, which consists of a series of nervous masses or ganglia, joined together by two

nervous threads, the whole constituting a nervous chain, from which nerves ramify to the different organs, enduing them with the various senses they possess; from the first ganglin the nerves of the eyes and antennæ are fed, and from the second the mouth. Hearing and smell are certainly possessed by insects; but by what organ they are appreciated is not ascertained. Taste the seat of which is the mouth, sight in the eyes, and touch probably in the antennæ, the palpi, and in the tarsi of the feet.

The circulatory system is well represented in insects. The blood is generally colourless, but occasionally of a greenish or reddish hue. The heart, which comprises a series of large reservoirs in the form of a long tube plainly discernible through the transparent skins of caterpillars, lies above the alimentary canal on the upper surface of the body.

Insects do not breathe, like large animals, through their mouths; but by means of breathing-holes in their sides, which connect with two great air canals (tracheæ) which run along the sides of the body, and from which smaller tubes convey the air in very small volumes to different parts of the body, and so oxygenate the vital fluid in its passage. In the Arachnida this tracheal system is considerably modified, respiration being effected among some spiders by ordinary ramified tube-tracheæ, and among others in certain sacs or cavities in the abdomen which have been called pulmo-branchiæ from an idea that they partook both of the nature of the lungs of the higher animals and the branchiæ or gills of fishes; as, however, the blood does not penetrate these sacs but is merely oxygenated in its passage by and round them, while it is being re-collected after use and previous to being sent back to the dorsal vessel or heart, these cavities are now believed to be tracheæ localized within a peculiarly furnished sac. Tube-tracheæ when examined with the microscope are wonderfully beautiful. Traversing as they do the whole bodies of insects, many of which are soft-bodied, they must necessarily be very flexible, and it might be supposed that the rapid movements of the insect might sometimes cause them to collapse, in which case the circulation of the air would be stopped. Upon examination we find that there is a beautiful and simple contrivance which renders this impossible. The tubes consist of a double integument between which runs a hair-like spirally-twisted fibre, just like the coil of wire which is sometimes put inside india-rubber speaking tubes; this adds considerably to the elasticity of the air vessels, and when these collapse through the movements of the insect, it prevents the opposite sides from adhering, and causes them to resume their tubular form as soon as the pressure is removed. There are generally nine pairs of breathing pores or openings through which the air is admitted into the tracheæ. These openings are so constructed that it is impossible for dust to enter the tracheæ. At the outside orifice is a corneous plate, and inside that is a hollow chamber, and then at the other side of that is another valve. In perfect insects nearly all the air enters through the thoracic spiracles.

"When an insect is preparing itself for flight, the act of respiration resembles that of birds under similar circumstances. At the moment of elevating its elytra and expanding its wings, which are indeed acts of respiration, the anterior pairs of spiracles are opened, and the air rushing into them is extended over the whole body, which by the expansion of the air-bags is enlarged in bulk, and rendered of less specific gravity; so that when the spiracles are closed at the instant the insect endeavours to make the first stroke with, and raise itself upon its wings, it is enabled to rise in the air, and sustain a long and powerful flight with but little muscular exertion." In the pupal and larval state respiration is performed almost equally by all the spiracles; but in the imago almost all the air enters by those in and near the thorax, so that generally a pinch under the thorax will kill most soft-bodied insects by suffocating them.

Of the seven sub-orders into which true insects are divided, the one to which the first place is accorded is called Hymenoptera or membrane-winged insects. The members of this sub-order are easily recognized by the structure of the wings which are four in number (see fig. 45), membranous and without either scales or hairs; the second pair is always smaller than the first and the wings have not so many veins. On their anterior margin they have a row of stiff hooklets by which they are securely fastened to the front wings when in use. The veins in the wings are of great use in determining the genera; there are, however, some which are wingless; but may be easily recognized as belonging to this sub-order from their transformations and general structure.

The transformations of this sub-order are the most complete of all insects ; the larvæ in general form being more unlike, while the pupæ are more like, the perfect insect than in any other. The natural history of the Hymenoptera is full of interesting and instructive facts and furnishes examples of wonderful instinct and exquisite adaptation. Most of these will be observed in the care they take in providing for their young, and in laying up stores of food for winter use. It is owing to these highly developed instincts, added to the important part they play in the fertilization of many plants, in some cases being actually necessary, that Dr. Packard has placed them first in his system.

By far the larger proportion of these insects are beneficial, and feed either in the larval or perfect state upon other insects. Of beneficial insects mention must first of all be made though of the Honey Bee, concerning which alone whole volumes have been written, and afterwards of the different wasps and allied genera which feed upon and store up for the sustenance of their grubs enormous numbers of caterpillars and other insects, as well as acting as scavengers. Among the social bees, wasps and ants, there are found not only males and females but also other kinds of individuals which are necessary for the successful propagation of the species ; these are called neuters and sometimes labourers or nurses ; they are however essentially females, having the female organs but in an imperfectly developed and passive state, their sting being only an accessory part, which is changed into a special weapon of defence, and is the homologue of the ovipositor in fertile female insects. The worker bee, besides collecting the honey and pollen which is to serve as food for the offspring of the queen, has to carry the eggs from the queen to their proper cells and feed the larvæ when they are hatched ; they are therefore indispensable for the propagation of the race.

I class wasps among beneficial insects, because the sting for which they are dreaded is never used against man, except as an instrument of defence, while its proper use is the destruction of his enemies, the caterpillars of numerous noxious species of insects.

Although some members of the wasp family do fill their cells at certain periods with honey, the food of the greater part, undoubtedly, consists of animal matter, chiefly other insects, which they either seize with their mandibles, or when it is to be stored away for the use of the larvæ, they sting to death. The poison introduced by the sting owes its virulence to the presence of a peculiar acid known as formic acid. This acid is said to be chemically very similar to chloroform, and its action upon insects stung to death is very peculiar. It does not kill them out-right, but paralyzes them, so that they live for many days,and in some cases larvæ have been known to turn into pupæ after having been stung, but have not had sufficient strength to complete their final change into *imagines*. The use of this antiseptic property of the poison is easily seen. The mother wasp, having prepared the nest for her young, fills it with insects which she stings to death ; she then lays an egg and closes up the nest. Upon the grub hatching it has a larder well supplied with provisions which will keep fresh as long as required for it to complete its transformations.

The Ants do not demand much of our attention in this country as either injurious or beneficial insects, although there are a few species which are occasionally troublesome and destructive to posts and fences. The almost human aspects of ant-life, however, as exhibited by different species, provide a favourite study for the entomologist, and an investigation of them could not fail to fill even the least curious with wonder and amazement. Their dwellings are constructed on the most scientific architectural patterns ; some species have their cows (aphides) which they tend with the utmost care. There are some again which make expeditions against less powerful ants, and carry them off to serve them as domestic servants, upon which they are entirely dependent, and without which they are almost helpless. Others, notably the celebrated Agricultural Ants of Texas, cultivate the ground, reap the harvest, and store up the grain. It is evidently to a species belonging to this class that Solomon refers when he says : "Go to the ant thou sluggard, consider her ways, which . . . gathers her food in the harvest." There are at least seven species of ant in Palestine which harvest the seed of grasses. In England Curtis mentions one which sometimes carries off sufficient seed from turnip fields for it to be termed an "insect pest." Perhaps the most astonishing analogy to human customs is found in a description given at page 217 of the 5th vol. of the Journal of the Linnæan Society, of some ants in New South Wales which bury their dead with funeral honours, and punish

with death those not joining in the ceremony, and then as a further mark of degradation bury them in a different place, all together in one hole.

Of all the Hymenoptera beneficial to the farmer, none bear comparison with the several species of parasitic ichneumon flies, which lay their eggs in the bodies of other insects, in which the grubs live, and from the juices of whose bodies they derive their nourishment; it is curious, too, that these unbidden guests avoid most carefully all the vital parts of their hosts, and frequently the larvæ, with their strange inhabitants, change into pupæ before the parasites are evolved. These flies are, as a rule, very characteristic in appearance, and thus easily recognized. Fig. 51 represents one of these parasites (*Macroceptrus delicatus*), with its long delicate sting, which attacks the codling moth. For the most part they bear a very long ovipositor, with which they insert their eggs into the bodies of the insects which are to form their nursery. The abdomen of this family presents an almost endless variety of forms, which are adapted to the requirements of its chief use, viz.: the support of the organs of reproduction. In *Pelecinus polycerator*, the scorpion fly, the abdomen of the female is long and slender, while that of the male is short and club-shaped. In *Rhyssa lunator*, the handsomest of all our ichneumons, the ovipositor of the female produced to the extraordinary length of between three and four inches. It may frequently be found dead upon trees, securely fastened there by this organ, which it has been unable to withdraw after having deposited an egg in the body of some larva lying hidden beneath the bark. The genus Ichneumon proper is one of very great extent and usefulness. Two of its species are very common, and have been found to be the chief checks upon the multiplication of the dreaded Army Worm (*Leucania unipuncta*). Figs. 52 and 53 show the Army Worm in both the larval and perfect conditions. These two

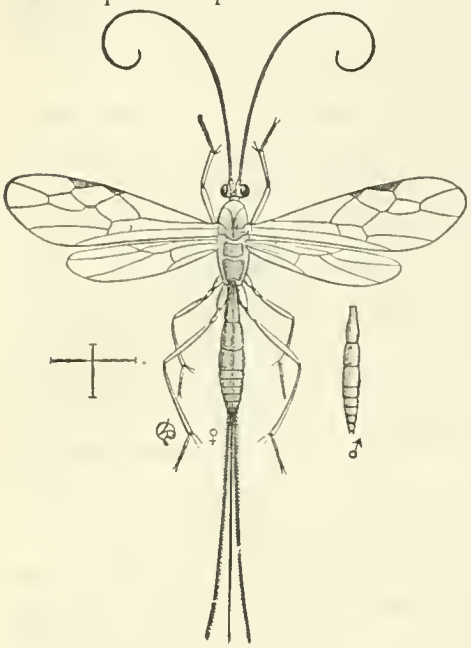


Fig. 51.

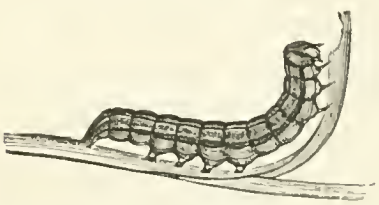


Fig. 52.

Fig. 53.

beneficial insects are *I. suturalis* and *I. paratus*. It is probably safe to say that there is no insect which is safe from the attacks of the ichneumons, and this statement also holds good even with regard to themselves.

To the genus *aphidius* belong several minute species which destroy the different kinds of plant lice.

There are even some which are parasitic upon the eggs of other insects, and which are so small that a magnifying glass is required to distinguish their forms.

Among the Chalcididæ are some exceedingly interesting insects. All are of small size and usually of shiny colours. The small species of parasitical Hymenoptera are particularly useful to man as checking many of the injurious species of Diptera, which from

their smallness have so far baffled all efforts to counteract them, and the Chalcididæ have received a high place in the estimation of all from the discovery that they prey upon some of those species which have appeared in such numbers as sometimes to threaten the total destruction of certain crops throughout whole districts, as for instance the various species of Cecidomya, a genus which includes many of the most dreaded pests as the Hessian fly, the wheat midge, the clover leaf and clover seed midges, and also many gall-forming species.

And now we come to some injurious kinds of Hymenoptera—first of all the gall flies which are closely allied to the chalcids; but are plant parasites. When the egg is laid in the leaf or green bark of a plant an abnormal growth of the vegetable cells is brought about which forms large tumors; upon the substance of these the larvæ feed. "These insects are examples of the uses that lie hidden in nature. Many thousand years had the gall flies been making their wonderful cells before any one discovered that the galls which disfigured the oak could be of any service to man. Yet within the gall lay the principal element of the ink which has had as important a part to play in civilization as the press itself, the latter depending almost wholly on the former. Scarcely larger than average sized hazel-nuts, the galls absolutely crowd the branches of an oak which grows plentifully in the Levant, and so it is to these insignificant insects that we owe one of the most absolute necessities of modern existence."*

The saw-flies seem to be a sort of intermediate link between the Hymenoptera and Lepidoptera; while the perfect flies are certainly Hymenopterous the larvæ closely resemble the caterpillars of Lepidoptera, they may, however, be easily known by the number of their legs which is twenty two, while true caterpillars have only sixteen,and also by a habit of curling up the hind part of the body when at rest; when full grown they spin a hard silken coccoon. The saw, or ovipositor, is a beautiful and complicated apparatus; with it the female makes incisions in different parts of leaves and deposits an egg in each slit. Some, however, as the common gooseberry fly (*Nematus ventricosus*) lay their eggs on the under side of the leaf (as shown in fig. 54), not inserted in the substance of it at all.

Fig. 54.

These insects are exceedingly troublesome, and have to be constantly watched and treated to "hellebore" or they will entirely denude the gooseberry and currant bushes just at the time the fruit is forming, when the leaves are most wanted. I am happy to say, however, that I have noticed this year considerable ravages among these larvæ and those of the common white butterfly, made by some fungous disease.

Another too well known saw-fly larva is the pear-tree slug (*Selandria cerasi*), which is sometimes very destructive.

There is also belonging to this sub-order a clumsy bow-legged purple and yellow fly, with clubbed anteunæ called *Cimbex Americana*, the large handsome larva of which may frequently be found feeding on birch and elm trees; it is white, with a delicate greenish-yellow tint, and has a black line down its back and a spot of the same colour at each spiracle.

The last family is the Uroceridæ or horn-tails, so called from a long horn upon the abdomen of the males, the object of which is probably protective in adding to the already formidable appearance of these insects. In colour and movements as well as somewhat in form, they much resemble wasps. This family was fully described by Mr. Harrington in the *Canadian Entomologist* for May of this year.

J. Fletcher, Ottawa.

* Wood's "Insects Abroad."

A CHAPTER ON MITES.

By Wm. Saunders, London, Ontario.

These tiny creatures, of which there are very many species, although not usually regarded as true insects, are closely allied to them, and have been classed with them by many authors. They have been included in the order APTERA, or wingless insects, which also embraces spiders, lice, etc. Small and apparently insignificant as these mites are, some species are grievous pests, others invade articles of food, while some others are parasitic on larger insects, and often cause their death. So little is generally known in reference to the habits and life-history of these minute creatures, excepting to those few naturalists who have paid especial attention to this subject, that it is hoped that a brief sketch of the most notable of the species will prove an acceptable and interesting chapter to most of our readers, and, at the same time, convey some useful information. A considerable portion of the material we shall present has been gleaned from the excellent work on APTERA, by the late Andrew Murray, F.L.S., the first of a series of works on Economic Entomology designed to serve as hand-books to the South Kensington Museum; a series which he had undertaken, but which his life proved too short to permit him to complete. The accompanying figures have also been chiefly obtained from the above work. These have been engraved by Mr. P. J. Edmunds, of London, Ont., and are faithful representations of the original cuts.

Mites vary very much in form, size and habits, but in their structure they have always some points of resemblance to each other. While nearly related to the spiders, mites never have the abdomen pedunculated, that is, joined to the body by a narrow point of attachment, as is the case with spiders, but it is always in one piece, and united to the last of the segments which bear the legs without any marked depression between them. When mature, as a rule, they all have eight legs; in some instances the hind pair is only partially developed, but traces of them can almost always be discovered. In their earlier immature stages mites have only six legs.

The known species are very numerous, and are divided into eight different families.

1. TROMBIDIINÆ, containing
    1. TETRANYCHI, spinning mites.
    2. TROMBIDIIDÆ, harvest mites
2. BDELLIDÆ, snouted harvest mites.
3. HYDRACHNIDÆ, water mites.
4. GAMASIDÆ, insect mite-parasites.
5. IXODIDÆ, ticks.
6. HALACARIDÆ, marine mites.
7. ORIBATIDÆ, beetle mites.
8. ACARIDÆ, including
    1. HYPODERIDÆ, subcutaneous mites
    2. HYPOPIDÆ, ichneumon mites.
    3. TYROGLYPHIDÆ, cheese mites.
    4. SARCOPTIDÆ, itch and louse mites.
    5. PHYTOPTIDÆ, gall mites.

In the first section of the

TROMBIDIINÆ

we find the genus *Tetranychus*, to which the "red spider" (*Tetranychus telarius*) belongs. This is a serious pest to gardeners, and one which all those who have to do with plants under glass are more or less familiar with. Fig. 55 represents the male of this species, very much enlarged, the mite itself being scarcely visible to the unaided eye. (The small dot within the circle at the side of the figure indicates the natural size.) The characteristics of this genus of mites seem to show a special affinity with the spiders, in their habit of spinning webs, for which purpose the claws of their feet are specially adapted. The mouth has a barbed sucking apparatus, by which the sap is sucked from the minute vessels in the leaves of the plants they attack. These mites vary very considerably in colour, influenced much in this respect by the food they devour; some are greenish and marked with brown specks on the sides, others are rust-coloured, or reddish, or even brick-red, the latter being the colour with which horticulturists are most familiar. It is probable that most of the individuals acquire more or less of a reddish hue, when fully mature.

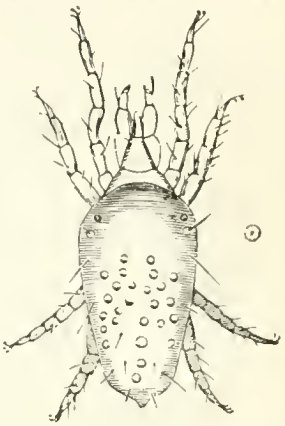


Fig. 55.

This mite spins a web on the under side of the leaves, of the finest and most delicate texture, the threads being so slender, that one fails to see them, even with the help of a magnifying glass, until after they are woven into a web or net-work. The threads are secreted from a conical protuberance situated underneath and near the extremity of the abdomen, and they are drawn out and guided by the motions of the insect, and by the action of the minute claws of the feet. In constructing the web the feet are moved quickly, and the threads are attached to the hairs and other prominences of the leaf, and under this shelter will be found a colony, consisting of many mature individuals of both sexes, and young mites of all ages, which feed and multiply rapidly. By the aid of their jaws, which are not unlike the beak of a bird, they tear away the surface of the leaf, and then plunge their beaked suckers into the wound and suck the juice.

The eggs of this mite are nearly round, colourless, and large in proportion to the size of the insect. The larva is a minute transparent object, not unlike its parent, but it has only six legs and creeps slowly. The leaves of the plants attacked soon indicate the presence of this invader by their sickly hue, the sap being sucked by myriads of tiny mouths the leaves are deprived of their natural nourishment, and soon assume a yellowish cast, with patches of a grayish or lighter shade, the under surface becomes whitish, and if the the mite is allowed to pursue its course unchecked, the gardener soon finds his cherished flowers and shrubs much injured or destroyed.

This insect is said to pass the winter under stones, concealing themselves there when the leaves they have fed on have fallen.

The remedies used for such enemies as the red spider are various preparations of sulphur and soap, used separately or together, mixed with water, and applied to the plants with a syringe. Sulphur in any form seems useful; laying it in the form of powder upon the pipes in the greenhouse has been recommended. Plain soap and water is said to be effectual, indeed water alone freely used is regarded by some as sufficient; it is well known that the insect thrives best in a dry atmosphere. In applying these liquids, to insure success it is necessary that it be used so as to wet the under side of the leaves, if applied to the upper surface only, the mites may remain attached to the lower side with perfect security during the entire operation. The gardener is aided in his war against this pest by other mites and insects which prey upon them. The larvae of the lace-wing flies, and other friendly insects, are said to devour large numbers of them.

There are a number of other species belonging to the genus *Tetranychus* which injure plants and trees. The cucumber, the rose, the cyclamen, the vine, have each a different

mite which devotes special attention to them; another species is found only on various members of the family of Cacti; while there are still other species which affect other plants, shrubs and trees. Since the habits of all these are similar the remedies recommended for the red spider, will probably prove equally efficacious in these instances.

THE HARVEST BUG (*Tetranychus autumnalis*),

is of a brick red colour, and so small as to be scarcely visible to the naked eye. Figure 56 represents it in the larval or six-footed form, highly magnified. This insect has peculiarities in habit which distinguish it from those already mentioned. Though bred upon plants, such as beans and other vegetables, also on currant, raspberry, and gooseberry bushes, yet when opportunity presents, they will desert these and fasten on animals, manifesting a particular fondness for the human race, especially women and children. The mites fasten upon the skin, particularly where any part of the dress fits closely, and there adhere by their claws so firmly that they can scarcely be detached without violence. Where one of these mites fixes itself a swelling occurs about the size of a pea, sometimes much larger, accompanied with severe itching, the severity of the swelling and itching varying in different individuals. In the chalky districts of Hampshire, England, these pests are especially abundant, also in some parts of Scotland and France; they do not confine their attacks to mankind, but are troublesome also to horses, cattle, sheep, dogs, cats and rabbits. It is in the larval or six-footed form in which this species is most frequently met with, the perfect eight-footed insect being seldom seen.

Fig. 56.

Kirby and Spence mention a similar insect which occurs in Brazil in great numbers. They insinuate themselves into the skin, and occasion intolerable itching, followed by larger swellings which subside in a day or two. Another species with similar habits occurs in Mexico.

TROMBIDIUM IRRITANS,

commonly known as the harvest mite, or "jigger," (fig. 57) is met with in the Mississippi valley where it is very troublesome, and produces much irritation in the skin wherever it attaches itself. Many species of harvest mites also feed on the leaves of plants, but they do not spin webs. They are also found in damp moss or on moist earth or stones, and vary in size from a pin's point to a pin's head. Those belonging to the genus *Trombidium* are parasitic in their habits.

Fig. 57.

TROMBIDIUM PARASITICUM

is a minute blood-red mite which attacks the house-fly. Prof. Riley, in his Seventh Annual Report states that in some seasons in the west scarcely a fly can be caught that is not infested with a number of these blood-red mites clinging tenaciously around the base of the wings. The accompanying figure (58) represents this mite in its immature state.

Fig. 58

TROMBIDIUM HOLOSERICEUM.

This species is found in Europe attacking the long-legged harvest spider, adhering generally behind the haunches. It is of an orange scarlet colour.

TROMBIDIUM BULBIPES

is a mite described by Dr. Packard in his Third Report on Injurious and Beneficial Insects

in Massachusetts. He found it on rose bushes in his garden where it was busily engaged devouring plant lice. It is of a scarlet red colour.

The Grasshopper Parasite (*Trombidium gryllarium*).

As in other classes of insects, mites furnish us with friends as well as enemies. In this instance we find an ally who carries on war against the grasshoppers. Harris, in his "Insects Injurious to Vegetation," page 191, draws attention to the fact that locusts in the Eastern States "are much infested by little red mites; these so much weaken the insects by sucking the juices from their bodies, as to hasten their death. Ten or a dozen of these mites will frequently be found pertinaciously adhering to the body of a locust, beneath its wing-covers and wings. A mite similar if not identical has been found at work among the swarms of locusts which inhabit the Western States. It is described by Dr. Le Baron in his first Report on the Insects of Illinois, in 1872. Figure 59 represents it in the larval condition. They are red, about one-thirtieth of an inch in length, and are found chiefly on the under side of the basal half of the under wings where they adhere so firmly that it is difficult to scrape them off with a pen-knife. The mite so attached soon swells so much that its six small legs, quite visible at first, become almost invisible, lost in the swollen body. These little mites help much to reduce the numbers of the destructive locusts; they suck the bodies of their victims until they become exhausted and die.

Fig 59.

Trombidium Sericeum.

This species (fig. 60) in also red. It has been found devouring the eggs of the destructive locusts in Iowa and Minnesota, creeping into the holes in which the eggs have been deposited and devouring their contents.

During the winter of 1878 an undetermined species of *Trombidium* was observed by me devouring the eggs of the moth of the forest tent caterpillar. On examining some egg clusters one evening under the microscope it was observed that at some points the glutinous coating which covers the clusters was imperfect, that a piece here and there had disappeared leaving the eggs bare, and in some cases some of the exposed eggs were empty. On cutting into the clusters they were found to be colonized by mites. The outside gummy matter is of a sufficiently porous texture to afford shelter to these little friends, who had evidently eaten into the eggs and devoured the young larvæ, and had also consumed the missing portions of the gummy covering. In the range of a single section of an egg-mass some eggs would be found uninjured, while from others there would proceed several (in some instances as many as five) active little mites, who, when thus disturbed, would run in and out of their dwelling places, at the same time keeping up a peculiar drumming motion with their tiny antennæ. Besides the smaller, younger specimens, four or five of which could find ample room and to spare within a single egg shell, there were other larger specimens apparently of the same species, but more mature. These were of a pale red colour, with bright, red eyes, more sluggish in their movements, and one such specimen would nearly fill an egg. On the outside, clusters of pale red eggs were found, supposed to be the eggs of these mites.

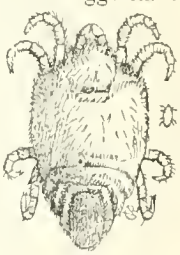


Fig.60.

On almost every egg-mass examined some of these mites were found, and if they are thus generally distributed over the whole area inhabited by these moths they must prove a very efficient check to the undue multiplication of the species. There are mites also which prey upon the eggs of the oyster-shell bark louse, and on those of the canker worm.

Among other families of mites may be mentioned the

Snouted Mites (*Bdellidæ*),

the fresh water mites, most of whom live on water insects, there are also some species of

mites found in salt water. Besides these there are the Gamasids, many of which are parasitic on insects, while some are troublesome to birds and other animals, *Gamasus coleoptratorum* and *G. marginalis* are found on various beetles. *Uropeda vegetans* also attacks beetles. When a beetle is infested with this mite, it seems as if covered by a large number of small fawn-coloured shining convex scales, attached to various parts of the underside of the body, and on the parts infested, covering the body so completely that none of it can be seen. They are not easily detached, and when forcibly removed they do not fall off but hang by a fine thread, exuded from their bodies, which is attached to the beetle. There is also the forage mite, which is found in Europe, in great numbers amongst old hay, and which when shaken down from the rack, on the heads and necks of the animals feeding on it, occasions them much annoyance.

DERMANYSSUS AVIUM

is the so-called tick, that infests domestic poultry, canaries and other cage birds. Fig. 61 gives a good idea of this creature, which is not much larger than a cheese mite. It lives especially in poultry houses, and on their inhabitants, and from these the mites sometimes migrate to the persons who have charge of them, and occasion them considerable annoyance. These mites also infest the cages of singing birds, and harbour about the crevices in the cage, and about the perch, from which they sally during the night, and burrow among the feathers of the sleeping birds and suck their blood. Other species belonging to this genus and allied genera feed on swallows, pigeons, doves and other birds, also on bats, indeed on this subject, did space permit, we might enlarge almost indefinitely, since there are species infesting almost every species of bird, beast and reptile in existence, as well as many insects, and on a variety of vegetable substances, especially mosses and fungi. One species has been found in the abdominal cavity of a dead flea, thus :

Fig. 61.

"The little fleas, that do so tease,
Have smaller fleas that bite 'em,
And these again have lesser fleas,
And so *ad infinitum*."

In the genus

TYROGLYPHUS

are included several interesting and well known species. *Tyroglyphus entomophagus* feeds on animal substances, being very partial to the dried insects, in the collections of the entomologist. In fig. 62 we have *Tyroglypus mycophagus*, a closely allied species, highly magnified; they are both very minute, yet easily seen with the naked eye. When once *T. entomophagus* gains access to a collection its presence is soon evidenced, by the dust which gathers on the bottom of the drawers, under or about the insects on which they are feeding. If allowed to proceed unmolested, they soon so far devour the bodies of the specimens so attacked, as to reduce them to a mere shell, which frequently falls to pieces in the handling. They are especially destructive to moths and butterflies. As soon as any appearance of dust occurs under any of the preserved insects in a case, such specimens should be at once attended to, and treated with a liberal application of Benzine, which will kill the mites without injuring the subjects infested. Insects which have not been thoroughly dried before being placed in the cabinet, are most liable to attacks, especially such as have been bred. Exposure to dampness also favours the

Fig. 62.

increase of mites, especially if associated with mouldiness; indeed mould and mites most frequently go together.

The Common Cheese Mite (*Tyroglyphus siro*).

This tiny creature, scarcely visible to the unaided eye, is soft, smooth and fleshy, with a whitish body, and feet furnished with suckers and claws. Fig. 63, which represents one of these mites highly magnified, will convey a better idea of its general aspect than any verbal description we can give. It lives in almost every kind of cheese when a little decayed, and particularly in the harder portions. When in a warm atmosphere they are active, constantly gnawing at the cheese and reducing it to powder. This powder is composed of little greyish balls of excrementitious matter, eggs, both empty and unhatched, larvæ, pupæ, and perfect mites, with cast skins and fragments of cheese; Exposed to a low temperature, the individuals soon gather into groups or heaps in hollow places in the cheese, and there remain in a state of torpidity until awakened again by warmth. This mite is also found in flour.

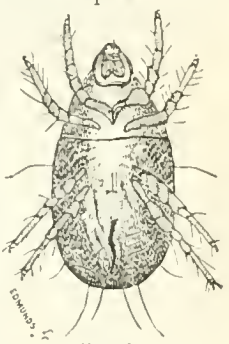


Fig. 63.

It multiplies very rapidly either in cheese or flour. A few specimens transferred from a mitey cheese to an old cheese not mitey, will soon colonize it thoroughly. They are probably harmless, since there are no records of any disease occasioned by them, although they are daily eaten in numbers too great to be estimated, and so carelessly, that hundreds of living individuals must escape the grinding of the molars and be swallowed alive.

The Scarcer Cheese Mite (*Tyroglyphus longior*).

This species is found associated with the common cheese mite, but seldom in any great abundance, rarely in larger proportion than fifteen or twenty, and sometimes not more than one, to a hundred. It is very easily distinguished from the common cheese mite, by its larger size, greater length of body, and longer hairs, while very similar in its habits it is much quicker in its movements. This species also attacks the dried Spanish flies or cantharides kept by druggists, and used for blistering purposes. A French naturalist, M. M. Fumouse, has studied the life-history of this mite, by placing some of them with a sufficient supply of food between two plates of glass. The females laid oval eggs in great abundance, which hatched in from ten to fifteen days, the young mites being at first as usual six-footed. During their growth, and after casting their skins once or twice, they acquire an additional pair of legs, making eight in all, and soon reach maturity.

This species some fifty years ago acquired much notoriety on account of its having been stated that it could be produced by electricity. At that time the idea obtained in the minds of some that electricity was the source of many of the phenomena of life. Two experimenters, Messrs. Cross and Weekes, of England, endeavoured to ascertain whether organic beings could not be produced by electricity. For this purpose pumice stone kept moist by a dilute solution of silicate of potash and muriatic acid was subjected to a constant stream of electricity, and after a time some of these mites were found wandering about the apparatus, and the conclusion was at once arrived at that they had been produced through the agency of electricity. A specimen was sent to a French naturalist who had made a special study of mites, who found it to be a female of this species with its body distended with eggs, which, as he drily remarked, seemed rather an unnecessary complication in a new creation.

Tyroglyphus Malus

(fig. 64), is a North American mite, which is a friend to the fruit grower since it destroys the eggs of the oyster-shell bark louse, so injurious to the twigs of the apple tree.

Passing by the sugar mites which are found in such abundance in the commoner grades of brown sugar, we come to the family *Sarcoptidae*, which includes a class of mites

Fig. 64.

Fig. 65.

which infest animals and burrowing under their skin cause irritation and swellings. The most notable and familiar example in this class is the

Itch Mite *(Sarcoptes scabiei)*.

Figure 65 represents a male of this species highly magnified; naturally they are so small as to be distinguished with difficulty by the unaided eye. This tiny, bristly creature lives under the human skin in little tunnels eaten away by itself. In fig. 66 we have one of

Fig. 66.

these minute channels represented with the female mite at one end. As she works her way under the skin she lays her eggs behind her as shown in the figure, which hatch in from four to six days. It is said that one mite will lay as many as fifty eggs. The young mites have but six legs, and during their growth change their skin four times, at the final moult acquiring an additional pair of legs, or eight in all. When one of the vesicles caused by this insect is minutely examined a tiny spot will be found upon some part of its surface, this is the point where the mite has entered, and from it a faint line or streak may be traced, usually more or less curved, which is the burrow which the creature has made, and in which it lives. The burrow varies in length, and is sometimes as much as five or six inches long, and at the end, under a slight elevation of the skin, the little pest lies concealed, and if the skin there be gently raised with the point of a needle the mite may be easily extracted, as the little creature clings with its sucker-like feet to any object with which it may come in contact.

The unpleasant disease referred to is of course occasioned by this mite, and is transferred by those infected to others, sometimes by actual contact, but more frequently by occupying beds with an infected person, or after them. This is readily accounted for from the habits of the mite, which during the day hides under the skin, but is active and leaves its hiding place at night. This pest was formerly much more common than it is now, the more general and free use of soap and water has done much to render it scarce; still, sometimes, when bodies of men are crowded together, with little opportunity to attend to personal cleanliness, it appears and spreads rapidly.

ANTS.

By the Rev. C. J. S. Bethune, M.A., Port Hope, Ont.

No family of insects is more widely distributed and more generally familiar to mankind than that of the ant, while its habits of industry and activity have been proverbial amongst all nations since the days of Solomon. Some account of its natural history and curious habits cannot fail, we think, to be of interest to the readers of these Reports.*

1.—Introductory.

The insects included under the common name of ant belong to two very different orders, which present strongly marked characteristics both in structure and in habits. Our common ants in this country are all members of the same order of insects *(Hymenoptera)* as bees, wasps and saw-flies, and possess many of the familiar peculiarities of the first mentioned. In tropical countries there is another family of ants, known by the name of *Termites* or white ants, and equally interesting to the lover of natural history; these belong to the order *Neuroptera*, which includes dragon-flies, May-flies, caddis-flies and other well-known insects. Of these we shall not at present treat, though as the white ants have become troublesome as far north as Boston, and may possibly be found in Canada, we shall probably give some account of them on a future occasion.

The insects of the order *Hymenoptera* are distinguished by the possession in their perfect state of four membranous wings, though occasionally the wings are wanting, as in the case of certain members of the ant community. The mouth is furnished with organs for mastication and suction; the abdomen in the female is provided with an ovipositor or a sting; the eyes are generally large and prominent, occupying in some cases the greater portion of the head. The Hymenopterons insects also undergo a "complete metamorphosis"—that is, they go through four distinct changes, first the egg, secondly the grub or larva, third the quiescent pupa or chrysalis state, and lastly the perfect imago or winged insect. They are remarkable among insects, and indeed amongst all the lower tribes of animals, for the wonderful development amongst many families of social instincts of a high order, living as they do in large communities regulated by definite laws, each member of the society apparently subordinating his individuality to the welfare of the general community, and therefore performing certain definite duties of a public character.

2.—Structure.

The common ants to which we are now referring belong to the family *Formicidæ*; they are distinguished by their habit of residing in more or less numerous societies either under ground or in decayed timber, whence arises the necessity for a greater number of individuals having their sexual organs abortive, so as to be able to devote themselves without interruption to the labours of the community; for this purpose also they are destitute of wings. The males and females, possessing wings, are naturally much less numerous, being only required for the propagation and continuance of their species. There are thus three grades of inmates in each society, termed respectively, males, females and neuters.

The males have a small body, with long and slender legs and antennæ, and are furnished with wings which they retain during life. The females are much larger, with shorter and thicker legs and antennæ; they are also furnished with wings, but cast off these

* In the compilation of this paper, free use has been made of the following works:—The article "Ant" in the *Encyclopædia Britannica*, 9th edition, vol. ii; Packard's *Guide to the Study of Insects;* Kirby and Spence's *Entomology;* Westwood's *Introduction to the Modern Classification of Insects;* Moggridge's *Harvesting Ants and Trap-door Spiders;* Miss Mary Treat's *Chapters on Ants;* etc., to which the reader is referred who desires fuller information.

organs after the process of pairing is over, and they are about to lay their eggs. The workers or neuters are somewhat smaller than the males, with antennæ resembling those

Fig. 67, Female Wood Ant (*Formica rufa.*)

Fig. 68, A Neuter Leaf-cutting Ant (*Eciton drepanophora.*)

of the females, being thickened to the tips, and elbowed; they are always destitute of wings. They often consist of two forms: one with a large cubical head, or worker major, sometimes called a soldier, and the other the ordinary small-headed form, or worker

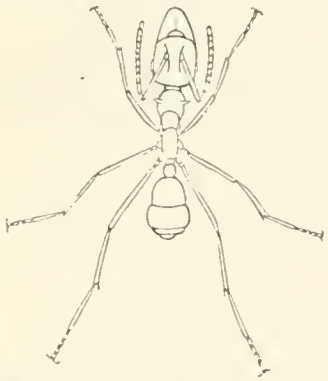


Fig. 69, Worker Major (*Ectatomma ferrugínea*).

Fig. 70, Worker Minor (*Formica fulvacea*).

minor. The antennæ of the male ants possess thirteen joints each, and those of the female and neuter twelve each. The head, including jaws, is more or less triangular in shape, broader behind than the thorax in the neuters, but somewhat narrower in the males and females. The mandibles or large jaws of the females and neuters are larger than those of the males, and are frequently toothed or serrated, sometimes hooked or sickle-shaped. The abdomen of the male consists of seven joints or segments, and that of the female and neuter of six. The external sexual organs of the neuters correspond to those of the females, but the internal reproductive organs are wholly undeveloped.

During the summer the winged males and females are produced in large numbers, and they soon leave the nest to take their "nuptial flight" in the air, in the course of which the females are impregnated. The function of the male ants having been thus performed, they die; the females, after impregnation, pull off their wings, and whilst in this somewhat helpless condition are conveyed by the neuters to new situations, where they lay their eggs and become the founders of fresh colonies.

Each fertile female or "queen" is carefully attended by a retinue of neuters, the latter, as we have seen, being simply females, whose sexual organs are undeveloped. The cause of this differentiation of sex, is probably owing to the nature of the food supplied to the ant during its larval state. Being thus exempted from all sexual functions, the duties of the neuters are confined to the performance of all the offices which contribute to, or are connected with, the welfare and labour of the ant community. They accordingly construct the nest or home, and keep it in constant repair; provide food and sustenance for the whole society; act the part of nurses in carefully attending to the hatching, nutrition and rearing of the young. They are also the defenders of the colony, in that they protect the nest and its inmates from the intrusion or attacks of any foes. In the species which possess two forms of neuters, the worker-majors or soldiers devote themselves especially to the care and protection of the community, and are provided for the purpose

with large mandibles or biting-jaws, which constitute efficient weapons of attack or defence ; while the worker-minors build and repair, collect food, attend to the young, and perform other household duties.

3. Ants' Nests.

Every one, no doubt, is familiar with the external appearance of many kinds of ants' nests, from the minute species which throw up little hills of sand, in our garden walks, to the large varieties which construct great mounds of rubbish in the woods and pasture lands. Few, however, have much acquaintance with the mode of construction, and the arrangement of these strange dwellings. The following account is given by Kirby and Spence :

"The nest of the large red ants, which are common in woods, at the first aspect seems a very confused mass. Exteriorly it is a conical mound, composed of pieces of straw, fragments of wood, little stones, leaves, grain—in short, of any portable materials within their reach. But however rude its outward appearance, and the articles of which it consists, interiorly it presents an arrangement admirably calculated at once for protection against the excessive heat of the sun, and yet to retain a due degree of genial warmth. It is wholly composed of numerous small appartments of different sizes, communicating with each other by means of galleries, and arranged in separate storeys, some very deep in the earth, others a considerable height above it—the former for the reception of the young in cold weather and at night, the latter adapted to their use in the daytime. In forming these, the ants mix the earth excavated from the bottom of the nest with the other materials of which the mound consists, and thus give solidity to the whole. Besides the avenues which join the apartments together, other galleries, varying in dimensions, communicate with the outside of the nest at the top of the mound. These open doors would seem ill-calculated for precluding the admission of wet, or of nocturnal enemies : but the ants alter their dimensions continually according to circumstances : and they wholly close them at night, when all gradually retire to the interior, and a few sentinels only are left to guard the gates. On rainy days, too, they keep them shut, and when the sky is cloudy open them partially.

"The habitations of these ants are much larger than those of any other species in this country, and sometimes as big as a small haycock ; but they are mere molehills when compared with the enormous mounds which other species, apparently of the same family, but much larger, construct in warmer climates. Malouet states, that in the forests of Guiana, he once saw ant-hills which, though his companion would not suffer him to approach nearer than forty paces for fear of his being devoured, seeemed to him to be fifteen or twenty feet high, and thirty or forty feet in diameter at the base, assuming the form of a pyramid, truncated at one-third of its height ; and Stedman, when in Surinam, once passed ant-hills six feet high, and at least one hundred feet in circumference. In the plains of Paraguay, where the ants commit great devastations, a species described by Dobrizhoffer forms conical earthen nests three or more ells high, and as hard as stone ; and in the Bungo forest in New South Wales, a very small ant builds nests of indurated clay eight or ten feet high." These immense mounds are probably the work of some species of *Termites* or white ants, not of the *Formicidæ*.

"The nest of *Formica brunnea* is composed wholly of earth, and consists of a great number of storeys, sometimes not fewer than forty, twenty below the level of the soil, and as many above, which last, following the slope of the ant-hill, are concentric. Each storey, separately examined, exhibits cavities in the shape of saloons, narrower apartments, and long galleries which preserve the communication between both. The arched roofs of the most spacious rooms are supported by very thin walls, or occasionally by small pillars and true buttresses ; some having only one entrance from above, others a second communicating with the lower story. The main galleries, of which in some places several meet in one large saloon, communicate with other subterranean passages, which are often carried to the distance of several feet from the hill. These insects work chiefly after sunset. In building their nest they employ soft clay only, scraped from its bottom when sufficiently moistened by a shower, which, far from injuring, consolidates and strengthens their archi-

tecture. Different labourers convey small masses of this ductile material between their mandibles, and with the same instrument they spread and mould it to their will, the antennæ accompanying every movement. They render all firm by pressing the surface lightly with their fore feet, and however numerous the masses of clay composing these walls, and though connected by no glutinous material, they appear when finished one single layer, well united, consolidated and smoothed. Having traced the plan of their structure, by placing here and there the foundations of the pillars and partition-walls, they add successively new portions; and when the walls of a gallery or apartment, which are half a line thick, are elevated about half an inch in height, they join them by springing a flattish arch or roof from one side to the other. Nothing can be a more interesting spectacle than one of these cities while building. In one place vertical walls form the outline, which communicate with different corridors by openings made in the masonry; in another we see a true saloon, whose vaults are supported by numerous pillars; and further on are the cross ways or squares where several streets meet, and whose roofs, though often more than two inches across, the ants are under no difficulty in constructing, beginning the sides of the arch in the angle formed by two walls, and extending them by successive layers of clay till they meet; while crowds of masons arrive from all parts with their particle of mortar, and work with a regularity, harmony, and activity, which can never enough be admired. So assiduous are they in their operations, that they will complete a storey with all its saloons, vaulted roofs, partitions and galleries, in seven or eight hours. If they begin a storey, and for want of moisture are unable to finish it, they pull down again all the crumbling apartments that are not covered in.

"Another species of ant (*M. fusca*) are also *masons*. When they wish to heighten their habitations, they begin by covering the top with a thick layer of clay, which they transport from the interior. In this layer they trace out the plan of the new storey, first hollowing out litttle cavities of almost equal depth at different distances from each other, and of a size adapted for their purposes. The elevations of earth left between them serve for bases to the interior walls, which, when they have removed all the loose earth from the floors of the apartments, and reduced the foundations to a due thickness, they heighten, and lastly cover all in. M. Huber saw a single working ant make and cover in a gallery which was two or three inches long, and of which the interior was rendered perfectly concave without assistance.

"The societies of *F. fuliginosa* make their habitations in the trunks of old oaks or willow trees, gnawing the wood into numberless storeys more or less horizontal, the ceilings and floors of which are about five or six lines asunder, black, and as thin as card, sometimes supported by vertical partitions, forming an infinity of apartments which communicate by small apertures; at others by small light cylindrical pillars furnished with a base and capital which are arranged in colonnades, leaving a communication perfectly free throughout the whole extent of the storey.

"Two other tribes of carpenter ants (*F. æthiops* and *F. flava*) use sawdust in forming their buildings. The former applies this material only to the building of walls and stopping up chinks; the latter composes whole stages or storeys of it made into a sort of papier mâché with earth and spider's web."

A species of ant (*Atta barbara*) has been found by Moggridge actually to make its nest in solid sandstone rock at Mentone in the south of Europe. He states that he traced some workers to a part of the sandstone rock where steps had recently been hacked out leading to some terraces and thus by accident discovered the nest, which he thus describes:—"I soon saw that the ants entered and came out from three or four small passages in the cleft surfaces of the rock, and that their nest actually lay in the sandstone itself. Having contrived to wedge off several large flakes of the rock, which was soft in most places and might be scooped out with a strong knife, I discovered that though some of the passages of the ants followed the lines of cleavage and the cracks made by the fine wiry fibres of the bushes growing on the surface, others were frequently made in the form of tubular tunnels through the living rock. Without the aid of hammer and chisel it was not possible to follow the galleries and to secure specimens of the mined rock; but on the next day I returned armed with tools, and with the assistance of a friend quarried out a portion of the nest, tracing it down eventually to twenty-three inches below the surface

of the rock in a vertical, and to about sixteen inches away from the surface in a horizontal direction. At one point where the rock was almost entirely solid and without flaw or crevice, and where it was clear that the passages were entirely the work of the ants, we measured a tunnel by worming a straw down it, and found it to be ten inches in length. We subsequently traced this tunnel or rock-gallery down until it communicated with a chamber filled with winged ants and seeds of several kinds." He afterwards discovered a second nest of the same kind.

Though almost all ants construct their nests under ground or in decayed timber, a species has been found in India, called *Myrmica Kirbii*, that builds its nests on the branches of trees and shrubs out of a most extraordinary material, namely, cow-dung! The nests are round in shape and about the size of an ordinary foot-ball. Flakes of dry cow-dung are placed upon each other like the tiles of a roof, so that although the insects can creep beneath them into the nest, no water can penetrate them; on the top of the nest there is placed one very large flake that crowns the structure and protects the rest.

4. Slave-making Ants.

Among the many very curious and extraordinary proceedings of ants is the practice, prevalent amongst some species, of making slaves of their weaker brethren. Regular expeditions are made by the slave-makers, commonly called Amazon ants, for the purpose of obtaining fresh supplies from the nests of the inferior species; these captives they compel to do all the hard labour required in their own community. This might seem incredible were it not attested by numbers of independent observers in different countries, some of whose accounts we may now transcribe. There are two species which are known to reduce others to slavery, viz., the russet ant (*Formica rufescens*), and the red ant (*F. sanguinea*); of the latter species there is an American variety. The best known descriptions are those made by Huber, a European observer, who devoted the greater part of his life to the minute observation of the lives and actions of insects. The following account translated from his works, is taken from Kirby & Spence:—

"Their time of sallying forth is from two in the afternoon till five, but more generally a little before five; the weather, however, must be fine and warm. Previously to marching there is reason to think that they send out scouts to explore the vicinity: upon whose return they emerge from their subterranean city, directing their course to the quarter from which the scouts came. They have various preparatory signals, such as pushing each other with the mandibles or forehead, or playing with the antennæ, the object of which is probably to excite their martial ardour, to give the word for marching, or to indicate the route they are to take. The advanced guard usually consists of eight or ten ants, but no sooner do these get beyond the rest than they move back, wheeling round in a semicircle, and mixing with the main body, while others succeed to their station. They have "*no captain, overseer, or ruler*," as Solomon observes, their army being composed entirely of neuters, without a single female; thus all in their turns take their place at the head, and then, retreating towards the rear, make room for others. This is the usual order of their march, and the object of it may be to communicate intelligence more readily from one part of the column to another.

"When winding through the grass of a meadow they have proceeded to thirty feet or more from their own habitation, they disperse: and, like dogs with their noses, explore the ground with their antennæ to detect the traces of the game they are pursuing. The negro formicary, the object of their search, is soon discovered; some of the inhabitants are usually keeping guard at the avenues, which dart upon the foremost of their assailants with inconceivable fury. The alarm increasing, crowds of its swarthy inhabitants rush forth from every apartment: but their valour is exerted in vain, for the besiegers, precipitating themselves upon them, by the ardour of their attack compel them to retreat within, and seek shelter in the lowest storey; great numbers entering with them at the gates, while others with their mandibles make a breach in the walls, through which the victorious army marches into the besieged city. In a few minutes, by the same passages, they as hastily evacuate it, each carrying off in its mouth a larva or pupa which it has seized in spite of its unhappy guardians. On their return home with their spoil, they

pursue exactly the route by which they went to the attack. Their success on these expeditions is rather the result of their impetuosity, by which they damp the courage of the negroes, than of their superior strength, though they are a larger animal; for sometimes a very small body of them, not more than 150, has been known to succeed in their attack and carry off their booty."

Mr. Kirby corroborates the foregoing account by the following description of his own observations several years later, when he had an opportunity of visiting Paris, and calling upon the celebrated French entomologist, M. Latreille: "He assured me," to quote Mr. Kirby's words, "that he had verified all the principal facts advanced by Huber; at the same time he informed me that there was a nest of the rufescent ants in the Bois de Boulogne, to which place he afterwards was so good as to accompany me. We went on the 25th of June. The day was excessively hot and sultry. A little before five in the afternoon we began our search. At first we could not discern a single ant in motion. In a minute or two, however, my friend directed my attention to one individual—two or three more next appeared—and soon a numerous army was to be seen winding through the long grass of a low ridge in which was their formicary. Just at the entrance of the wood from Paris, on the right hand and near the road, is a bare place, paled in for the Sunday amusement of the lower orders—to this the ants directed their march, and upon entering it divided into two columns, which traversed it rapidly and with great apparent eagerness; all the while exploring the ground with their antennæ, as beagles with their noses, evidently as if in pursuit of game. Those in the van, as Huber also observed, kept perpetually falling back into the main body. When they had passed this inclosure, they appeared for some time to be at a loss, making no progress, but only coursing about; but after a few minutes' delay, as if they had received some intelligence, they resumed their march, and soon arrived at a negro nest, which they entered by one or two apertures. We could not observe that any negroes were expecting their attack outside the nest, but in a short time a few came out at another opening, and seemed to be making their escape. Perhaps some conflict might have taken place within the nest in the interval between the appearance of these negroes and the entry of their assailants. However this might be, in a few minutes one of the latter made its appearance with a pupa in its mouth; it was followed by three or four more; and soon the whole army began to emerge as fast as it could, almost every individual carrying its burthen. Most that I observed seemed to have pupæ. I then traced the expedition back to the spot from which I first saw them set out, which according to my steps was about 156 feet from the negro formicary. The whole business was transacted in little more than an hour. Though I could trace the ants back to a certain spot in the ridge before mentioned, where they first appeared in the long grass, I did not succeed in finding the entrance to their nest, so that I was deprived of the pleasure of seeing the mixed society.

"M. Latreille very justly observes that it is physically impossible for the rufescent ants (*F. rufescens*), on account of the form of their jaws, and the accessory parts of their mouth, either to prepare habitations for their family, to procure food, or to feed them.

"*Formica sanguinea* (the red ant mentioned above) is another of the slave-making ants; and its proceedings merit separate notice, since they differ considerably from those of the rufescents. They construct their nests under hedges of a southern aspect, and likewise attack the hills both of the negroes and miners. On the 15th of July, at ten in the morning, Huber observed a small band of these ants sallying forth from their formicary, and marching rapidly to a neighbouring nest of negroes, around which it dispersed. The inhabitants, rushing out in crowds, attacked them and took several prisoners: those that escaped advanced no farther, but appeared to wait for succours; small brigades kept frequently arriving to reinforce them, which emboldened them to approach nearer to the city they had blockaded; upon this their anxiety to send couriers to their own nest seemed to increase; these spreading a general alarm, a large reinforcement immediately set out to join the besieging army; yet even then they did not begin the battle. Almost all the negroes, coming out of their fortress, formed themselves in a body about two feet square in front of it, and there expected the enemy. Frequent skirmishes were the prelude to the main conflict, which was begun by the negroes. Long before success appeared dubious they carried off their pupæ, and heaped them up at the entrance to their nest, on the side

opposite to that on which the enemy approached. The young females also fled to the same quarter. The sanguine ants at length rush upon the negroes, and attacking them on all sides, after a stout resistance the latter, renouncing all defence, endeavour to make off to a distance with the pupæ they have heaped up. The host of assailants pursues, and strives to force from them these objects of their care. Many also enter the formicary, and begin to carry off the young brood that are left in it. A continued chain of ants engaged in this employment extends from nest to nest, and the day and part of the night pass before all is finished. A garrison being left in the captured city, on the following morning the business of transporting the brood is renewed. It often happens (for this species of ant loves to change its habitation) that the conquerors emigrate with all their family to the acquisition which their valour has gained. All the incursions of *F. sanguinea* take place in the space of a month, and they only make five or six in the year. They will sometimes travel one hundred and fifty paces to attack a negro colony."

Let us now turn to an account of the proceedings of slave-makers nearer home. Miss Mary Treat has given a most interesting narrative of her observations of the doings of the American red ant *(F. sanguinea)* at her home in New Jersey ; the account was published in *Harper's New Monthly Magazine*, from which we extract the following description. It is the result, she says, of several weeks' close observation, to the exclusion of all other work, commencing the 1st of July and extending into August.

The nest of the red slave-makers was in a grove, and must have contained several thousand working inhabitants. About fifty feet from it was a nest of black ants *(F. fusca)*, apparently fully as large and strong as that of the red ants. Externally the two nests did not differ very much. The red ants raised a slight mound, while the blacks had simple excavations about the roots of an oak tree.

"On a sultry afternoon, the 1st day of July"—to quote Miss Treat's words—"I was lazily sauntering in the grove, when, on looking down, I found to my surprise, that I was in the midst of a battle-field. A powerful army of red ants had invaded the dominions of the black colony which for three years past I had had a kind of supervision over. I had often brought plants covered with aphides–the immortal Linnæus called these aphides the ants' cows—and stuck the plants into the earth around their dwelling, and had given them sugar, and had driven and carried toads from their nest which were devouring them. In short, I had become very much interested in and quite attached to this colony, but I was powerless to aid them now. I could only look on in wonder and astonishment.

"A yard or more around the foot of the tree the battle was raging, and no place for the sole of my foot without crushing the combatants. I found in every instance a red ant pitted against a black ; sometimes two red ones against one black, in which case the black was soon despatched. For three hours I watched the conflict ; all around me the combatants locked in a close embrace, rolling and tumbling about, never separating until one was killed, and often the dead victim had fastened with so firm a hold on his adversary that it was with the utmost difficulty that he could free himself from his death-grip. The sun went down, and the gathering darkness compelled me to leave my post of observation ; but as long as I could see, the conflict was as fierce as ever. I now picked up several of the warriors, but so intent were they in their terrible struggle that my handling did not divert them in the least. I carried several pairs into the house, placed them under a large oval glass on a marble-topped table, and watched the conflict.

"I found I had ten black and ten red warriors, not engaged in a general melee, but each intent upon killing his own adversary. It was fully an hour before the first warrior was killed—a red had at last despatched his black antagonist, and not satisfied with killing him, he tears his legs from his body and severs his antennæ. After convincing himself that he is really dead, he looks around at the other warriors which are still closely locked in their dreadful embrace, and now he hurries from one couple to another, as if to see where his services are most needed. He finds a couple whose struggles are nearly over—a black is fastened with a death grip to his adversary's foreleg. The red hero soon severs the head from the black soldier, and leaves it hanging to the leg of his dying comrade. He now goes to another couple who are still fiercely contending ; he seizes the black, and now all three roll and tumble about together ; but the black is soon killed, and, as in the other case, his mandibles are locked on his adversary's leg. But this time

our hero does not sever the head from the black soldier, but leaves his comrade to free himself as best he can, while he goes to the assistance of a third less fortunate brother, where the black seems to have the better of his antagonist. Here a long struggle ensues, and now another red soldier has despatched his opponent, and he comes to the struggling three, moves about them in an excited manner, with his mandibles stretched wide apart, waiting his opportunity to fasten them on the black; he finds his chance, seizes him between the thorax and abdomen, and severs the body in two; but the dying black does not relax his hold of the first antagonist, and they die together.

"I now leave the fierce combatants for the night. In the morning I find that every black is killed, and four red soldiers are dead, and two others cannot long survive. The legs and antennæ and mutilated bodies of the dead warriors are strewn about, every fragment showing conspicuously on the white marble. Out of the twenty, fourteen are dead and two nearly lifeless—only four have survived. I put some drops of water and moistened sugar under the glass for the surviving heroes; two find the water and drink. I now repair to the battle-field. The struggle is over, not a black to be seen, but a column of the red invaders is emerging from a large cavity that leads to the numerous galleries and underground chambers of these industrious blacks, and each invader is carrying a larva or pupa. I follow the column, which is from four to five inches in width, to the nest of red ants before mentioned. There is a wide opening in the side of this nest, down which they all disappear and leave their burdens, and again start for more plunder. All day long these powerful marauders are engaged in this work. They carry a larva or pupa carefully, and drop it on being disturbed. But what does this mean? Every little while a red warrior comes out with a black bundle, which he carries as carefully as he does the pupa or larva. I stop him to inquire into the matter; he drops his bundle, which immediately unrolls, and lo! it is a lively black ant, apparently unhurt, and to my eye, no way different from the warrior with whom he was so fiercely fighting."

It has been generally supposed that the red ants only took captive the young of the blacks, in order that, growing up in the home of their captors, they might have no desire to escape. "But these ants certainly carried a great number of adult blacks to their nest, and I am quite sure that they did not run away, but stayed and helped to nurse and feed the larvæ. I capture several of the red marauders with their victims, and place them under the glass. The reds now pay no attention to the blacks, but simply try to make their escape. I take larvæ and lay them on a leaf, and put them under the glass also, and place moistened sugar in their reach. Very soon the blacks are feeding the helpless larvæ. I remove the glass cover; the reds immediately run away, but the blacks stay, and continue to sip the moistened sugar and feed the young. I hold a magnifying-glass over them, and find the little larvæ raise up their heads and open their mouths to be fed, very much like young birds. I now take the larvæ, together with their nurses, and place them near the nest of red ants. I soon lose sight of the nurses, but the larvæ are quickly taken into the nest by the red soldiers."

After a few days another raid is made by the red ants. "The blacks open the large entrance of the nest, dragging the material with which it is closed to one side; and now the soldiers come out in full force, and march in a straight line to a spot about thirty feet distant; here they diverge, and seem to be hunting over the ground; soon they find a small colony of blacks. The greatest excitement now prevails among the invaders; some are passing down the main entrance, while others are rushing about with extended mandibles prepared for conflict; but the blacks are escaping from another opening a few inches distant, not trying to defend their young in the least. Very soon the marauders emerge, each with a larva or pupa. Those outside, seeming satisfied that there will be no battle, quiet down and join the ranks in ravaging the nest. In less than an hour the spoils are all taken; and the marauders, not satisfied in sacking so small a settlement, again form in line and march directly to another colony a few feet beyond the one they have so recently plundered. They go so directly to this spot that it looks as if it must have been a preconcerted plan. This colony also proves to be a small one, and the inhabitants all flee, leaving the young to be captured. In less than two hours the spoilers have transferred the young to their own nest; and now, apparently satisfied with their day's work, they make preparation to close the entrance—the blacks are clearing the passages which their

masters have littered while carrying in their booty. As soon as the passages are cleared, a large force is engaged in closing the entrance." Many more accounts of raids upon both black and yellow ants are given by Miss Treat, but the above will suffice to prove that slave making is a recognized "institution" among the red ants. The relative position of the masters and slaves seems to vary a good deal in the case of the species already referred to. The red ants (*F. sanguinea*) appear to bear a considerable share of the work of the community, and not to be entirely dependent upon the offices of their slaves; but the russet ants *(F. rufescens)* seem to be altogether above doing any kind of work for themselves, except when they are engaged in the military operations of attacking a nest of blacks—consequently, the entire work of the colony in their case devolves upon their slaves. Huber found by experiment that the russet ants would starve, if left to themselves, sooner than take the trouble to make use of food left conveniently within their reach. He relates that he "shut up thirty of these ants in a glazed box, supplying them with larvæ and pupæ of their own kind, with the addition of several negro pupæ, excluding very carefully all their slaves, and placing some honey in a corner of their prison. Incredible as it may seem, they made no attempt to feed themselves: and though at first they paid some attention to their larvæ, carrying them here and there, as if too great a charge they soon laid them down again; most of them died of hunger in less than two days, and the few that remained alive appeared extremely weak and languid. At length, commiserating their condition, he admitted a single negro; and this little active creature by itself re-established order, made a cell in the earth, collected the larvæ and placed them in it, assisted the pupæ that were ready to be developed, and preserved the life of the neuter rufescents that still survived."

It might be supposed that the lot of the enslaved ants was a very hard and cruel one, and that their bondage would be as distasteful to them as it usually is to human slaves. But it has been clearly shown by Westwood and others that it is quite unnecessary to bestow our compassion upon them, as the work they perform is exactly that for which they were made. The labours which the slaves undertake are not arbitrarily forced upon them by the fear of punishment, but are urged upon them by the instincts implanted within them. They would have worked precisely in the same manner and with the same industry and perseverance in their own nests as in that of their captors, and the labours are undertaken as willingly in the one case as in the other. They find themselves perfectly at home in the nest of their captors, and are in every respect on terms of equality with their masters. They have no other home but that to which they have been brought, and are no more to be pitied than our domestic animals that never have freedom.

As the slaves are always neuters, it is necessary that fresh supplies should be obtained as often as the demand for workers exceeds the available material; consequently raids have to be made for the purpose at frequent intervals during the season.

5.—Harvesting Ants.

From the middle of the last century until a few years ago, naturalists had agreed to doubt the ancient belief, dating from the days of Solomon, that ants show forethought and husbandry in the collection and storage of seeds and grains, because they had been unable to observe that anything of the kind was done. It is now, however, satisfactorily proved by the minute observations of competent persons, especially of Dr. Lincecum, in Texas, and Mr. Moggridge, in the south of France, that certain species of ants do exhibit the foresight and providence necessary for the storing of supplies of food to carry them through the wintry or rainy seasons.

Ancient authors abound in references to the harvesting operations of ants, which no doubt were quite familiar to them. There are, for instance, the well-known passages in the Book of Proverbs, where Solomon says (vi. 6-8):—"Go to the ant, thou sluggard; consider her ways, and be wise: which having no guide, overseer, or ruler, provideth her meat in the summer, and gathereth her food in the harvest;" and again (xxx, 25):—"The ants are a people not strong, yet they prepare their meat in the summer." Horace, Virgil, Plautus, Hesiod and other classical authors, also have allusions to the foresight of the ant. Claudius Ælianus, who lived in the time of the Emperor Hadrian, gives a detailed

account of the habits which he attributes to ants: "In summer time, after harvest, while the ears are being threshed the ants pry about in troops around the threshing floors, leaving their homes, and going singly, in pairs, or sometimes three together. They then select grains of wheat or barley, and go straight home by the way they came. Some go to collect, others to carry away the burden, and they avoid the way for one another with great politeness and consideration, especially the unburdened for the weight carriers. Now these excellent creatures, when they have returned home, and stored their granaries with wheat and barley, bore through each grain of seed in the middle; that which falls off in the process becomes a meal for the ants, and the remainder is unfertile. This these worthy housekeepers do, lest when the rains come the seeds should sprout, as they would do if left entire, and thus the ants should come to want. So we see that the ants have good share in the gifts of nature, in this respect as well as others. . . . . So the ants though they need no threshing time, nor men to winnow for them, nor an artificial draught of wind to separate corn and chaff, yet have the food of men who both plough and sow for it" (Moggridge).

The following account of modern harvesting ants is taken from Moggridge's valuable and interesting work. He found four species of genuine harvesters, and carried on observations from October to May at Mentone in the south of France. In a warm and sheltered valley, a few minutes' walk from the house in which he lived, he discovered thirty nests of the most active seed-storing ants. The spot was a rough slope of soft sandstone rock, with accumulations of sandy soil in the hollows, covered with a sparse and scrubby vegetation. Cultivated lemon terraces lay on the edge of the wild ground lower down in the valley, and at that season were overgrown with a rank crop of weeds, most of which were in seed. "I had scarcely set foot on the wild ground," he relates, "before I was met by a long train of ants (*Atta barbara*), forming two continuous lines, hurrying in opposite directions, the one with their mouths full, the others empty. About ten yards distant, partly shaded by some small bushes, lay the nest, to and from the entrance of which the incessant stream of incomers and outgoers kept flowing." The workers usually sought their harvest at some distance from the nest, going in search of it as far as the cultivated ground where the crops of weeds were more abundant and more varied. "In one case I was able to follow the thread-like column of workers from the nest to the weedy terrace, and found that the nearly continuous double line measured twenty-four yards. Even this gives but an inadequate idea of the number of ants actively employed in the service of the colony, for hundreds of them were dispersed among the weeds on the terrace, and many were also employed in sorting the materials, and in attending to the internal economy of the nest. Still this affords some evidence of the systematic and extensive scale on which foraging is carried on by this ant, and of the high importance which these creatures attach to their provision of grain."

The ants brought in not only seeds of large size and fallen grain, but also green capsules of shepherd's purse, chickweed, etc. They did not employ any materials in the construction of their nest, but simply excavated it out of the earth itself or the sandy rock; the large mounds, in great part composed of vegetable matter, frequently found at the entrances of their nests, were nothing more than the rubbish heaps of each establishment. They consisted in part of earth and grains of gravel brought from the nest during the excavation of the subterranean chambers, but principally of plant refuse, such as the chaff of grasses, empty capsules, gnawed seed-coats, and the like, which would occupy much space if left inside the nest. While an army of workers is employed in seeking and bringing in supplies, others are busy sorting the materials thus obtained, stripping off all useless envelopes of seed or grain and carrying them out to throw away.

"I selected a nest," Moggridge relates, "where the coarse and hard rock lay near the surface, compelling the ants to extend their nest in a horizontal direction. Here, almost at the first stroke, I came upon large masses of seeds carefully stored in chambers prepared in soil. Some of these lay in long sub-cylindrical galleries, and owing to the presence in large quantities of black shining seeds of amaranth, looked like trains of gunpowder laid ready for blasting. There were in this nest seeds, etc., which had been taken from more than twelve distinct species of plants, belonging to at least seven separate families. The granaries lay from an inch and a half to six inches below the surface, and were all

horizontal. They were of various sizes and shapes, the average granary being about as large as a gentleman's gold watch."

"I was greatly surprised to find that the seeds, though quite moist, showed no trace of germination, and this was the more astonishing, as the self-sown seeds of the same kinds were then coming up abundantly in gardens and on terraces." In order to investigate this matter thoroughly he collected and carefully examined large quantities of the grain and seeds taken at different times from the stores of twenty-one distinct nests, the first of which was opened on October 29th, and the last on May 5th. In these twenty-one nests, out of the thousands of seeds taken, he only found twenty-seven in seven nests which showed trace of germination, and of these eleven had been mutilated in such a way as to arrest their growth. Yet the vitality of the seeds was not destroyed, as he proved by raising crops of various weeds from seeds taken out of these granaries.

"When the seeds do germinate in the nests," he relates, "and it is my belief that they are usually softened and made to sprout before they are consumed by the ants, it is very curious to see how the growth is checked in its earliest stage, and how, after the radicle or fibril—the first growing root of dicotyledonous and monocotyledonous seeds—has been gnawed off, they are brought out from the nest and placed in the sun to dry, and then after a sufficient exposure, carried below into the nest. The seeds are thus in effect malted, the starch being changed into sugar, and I have myself witnessed the avidity with which the contents of seeds thus treated are devoured by the ants."

In an appendix, Mr. Moggridge gives corroborative testimony from other observers, from which the following extracts are taken. Lieut. Colonel Sykes, in his descriptions, of new Indian ants, relates: "In my morning walk at Poonah, June 19th, I observed more than a score of little heaps of grass-seeds in several places, on uncultivated land near the parade ground; each heap contained about a handful. On examination, I found they were raised by a species of ant (*Atta providens*), hundreds of which were employed in bringing up the seeds to the surface from a store below; the grain had probably got wet at the setting in of the monsoon, and the ants had taken advantage of the first sunny day to bring it up to dry. The store must have been laid up from the time of the ripening of the grass-seeds in January and February. As I was aware this fact militated against the observations of entomologists in Europe, I was careful not to deceive myself by confounding the seeds of a *Panicum* with the pupæ of the insect. Each ant was charged with a single seed, but as it was too weighty for many of them, and as the strongest had some difficulty in scaling the perpendicular sides of the cylindrical hole leading to the nest below, many were the falls of the weaker ants with their burdens from near the summit to the bottom. I observed they never relaxed their hold, and with a perseverance affording a useful lesson to humanity, steadily recommenced the ascent after each successive tumble, nor halted in their labour until they had crowned the summit, and lodged their burden on the common heap."

"On the 13th of October of the same year, after the closing thunderstorms of the monsoon, I found this species in various places similarly employed as they had been in June preceding; one heap contained a double handful of grass-seeds. It is probable that the *Atta providens* is a field species of ant, as I have not observed it in the houses."

Dr. Jerdon, in a Madras journal, gives a somewhat similar account of the same ant, stating that it digs up small garden seeds immediately after they are sown, and carries them off to its nest, to the great annoyance of the gardener. Mr. Home gives an account of similar observations in another part of the East, and Mr. Buchanan White records the harvesting performances of a colony of ants at Capri. With all this testimony we cannot but believe that the ancients were right and modern European entomologists wrong as regards this interesting characteristic of these species of ants.

Miss Mary Treat, whom we have already quoted, gives, in a paper communicated to *Lippincott's Magazine*, a very graphic and interesting account of her observations on harvesting ants in Florida. Their nests are abundant in the low pine barrens of that State, and consist externally of a little mound, surrounded by a circle of small chips and bits of charcoal, often brought from some distance; the mounds are regular in outline, with a crater-like depression on the summit, in the centre of which is the entrance. Their colour is reddish brown, and they are furnished with stings, which inflict about the same

amount of pain as that caused by honey bees. There are three sets of neuters in each colony—major and minor workers and soldiers, and one wingless queen.

"Early in December, 1877," Miss Treat relates, "I brought a large colony of these ants from one of the hills, including the workers, major and minor, and soldiers, and established them in a glass jar which I placed in my study. They very soon commenced work, tunnelling the earth and erecting a formicary, as nearly as they could after the pattern of their home on the barrens. The mining was done entirely by the small workers. At first they refused all animal food, but ate greedily fruit and sugar; and all kinds of seeds which I gave them were immediately taken below, out of sight. I now visited the mounds on the barrens, and found abundant indications of their food supplies. At the base of each mound was a heap of chaff and shells of various kinds of seeds. The chaff was of *Aristida speciformis*, which grew plentifully all about. I also found many seeds of *Euphorbia* and *Croton*, and several species of leguminous seeds. But the ants were not bringing seeds in at this time of the year; they were only carrying out the discarded seeds and chaff; and only on the warmest days were they very active. But they do not wholly hibernate. Even after a frosty night, by ten o'clock in the morning many of the hills would be quite active.

"On excavating a nest, I found chambers, or store-rooms, filled with various kinds of seeds. But, so far as I have observed, the seeds are not eaten until they are swollen or sprouted, when the outer covering bursts of itself. At this stage the starch is being converted into sugar, and this seems to be what the ants are after. They also seemed to be very fond of the yellow pollen-dust of the pine. The catkins of the long-leaved pine commenced falling in February, and I noticed ants congregated on them; so I took those just ready to discharge the pollen, and shook the dust on the mound in little heaps, which were soon surrounded by ants, crowding and jostling each other in their eagerness to obtain a share.

"The colony in the glass jar seemed perfectly contented, not trying to make their escape at all. The earth was originally a little more than two inches in depth, but by the first of February these wonderful architects had reared their domicile to the height of six inches. They raised tier upon tier of chambers in so substantial a manner that they never fell in. One of the store-rooms in which they deposited the seeds I gave them was at the bottom of the jar, and the seeds were stored against the glass with no intervening earth between; it contained about a teaspoonful of millet. I gave this chamber the right degree of heat and moisture to sprout the seed by pouring a little water down the side of the jar until it penetrated the chamber, and then setting it near the fire. The ants soon appreciated the condition of this store-room, and many congregated there and seemed to be enjoying a feast. The next day the seeds were all brought to the surface and deposited in a little heap on one side of the jar, where many of them grew, making a pretty little green forest, which the ants soon cut down and destroyed. This chamber remained empty for three or four days, and was then again filled with fresh millet and apple and croton seeds."

On excavating some nests of the same species (*Atta crudelis*) in their native haunts on the barrens, she found granaries of seeds scattered irregularly throughout to the depth of twenty-two inches below the surface of the ground; some were near the surface, and a few scattered about in the mound had sprouted. The mound is usually not more than four to six inches above the level of the ground.

"The great majority of nests," she adds, "that I have found are in the low pine barrens—so low that on reaching the depth of two feet the water runs into the cavity like a spring, and stands above some of the granaries. Notwithstanding this wet locality, I found no sprouted seeds in the deeper store-rooms, but only in the warmer mound. On sunny days the larvæ are brought up into the mound and deposited in chambers near the surface, where they receive the benefit of the sun's rays. On cool, cloudy days and in the early morning I found no larvæ near the surface. If the ants are intelligent enough to treat the larvæ in this way, why should they not store seeds where they will not sprout? And when they need to sprout them in order to obtain the sugar they contain, it would take no more wisdom to treat the seed as they do the larvæ—bringing them near the surface to obtain the right degree of heat for the required result."

6.—How to Get Rid of Ants.

As we have now almost exhausted the space allotted to us for this subject, we shall close with the mention of a few modes of getting rid of ants, as no doubt they are more familiar to our readers as domestic pests than in the interesting character described above. We find that we must leave over to another year any account of many other varieties of ants, such, for instance, as the dreaded driver ants of Africa, the agricultural ants of Texas, the leaf-cutting and foraging ants of Central and South America, (see figs. 71, 72 and 73), the honey ants of Mexico (see fig. 74) and other remarkable species. We must

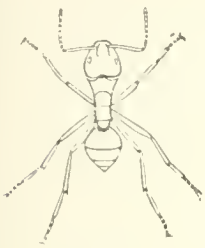


Fig. 71.

Fig. 72.

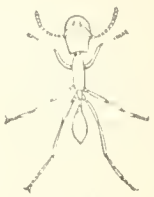


Fig. 73.

Fig. 74.

Fig. 71, Worker Major (*Polyrhachis arboricola*). Fig. 72, Worker Minor (*Eciton Mexicana*). Fig. 73, Worker Minor (*E. Sumichrasti*). Fig. 74, the Honey Ant of Mexico (*Myrmecocystus mexicanus*).

also postpone any description of the wonderful works of ants, in road-building, tunnelling, well-digging, etc., their care of aphides, domestic life, intelligence, language and other particulars, which, we have no doubt, are of great interest to all lovers of natural history.

Numerous, and not uncalled for, are the complaints that house-keepers make in this country respecting the inroads upon their sugar and preserves and other goodly stores, by the swarms of little ants that infest our houses in the summer time; but the annoyance caused by these tiny creatures in this country cannot for a moment be compared with the fearful ravages they often commit in hot climates. The following are some modes recommended for their destruction when they come into the house: (1) Take a coarse sponge, damp it slightly, and then dust over and into it some finely pulverzed sugar; lay the sponge in the place that they most frequent, removing for the time any sweets that they usually attack. In a very short time the sponge will be found full of ants; dip it in boiling water, squeeze out the dead bodies, and repeat the operation. A little perseverance will exterminate the pests. (2) A somewhat similar plan is to lay fresh bones around their haunts; they will leave everything else to attack them. When thus accumulated, destroy as before by dipping in hot water. (3) Another plan that has been found effective, but we do not recommend it owing to the danger arising from any carelessness in its use, it is to put arsenic or Paris green in highly sweetened water, and set the vessel in their way. It is said that in two or three days no more will be seen. (4) When ants are troublesome in flower-beds or lawn they may be de-

stroyed by pouring very hot water copiously into their nests, or by using coal-oil in the same way; a few tablespoonfuls is said to suffice for the destruction of a nest. (5) The burying of a few sliced onions in the nest is said to cause them to abandon their quarters; but if so, they may remove to an equally unsatisfactory position. (6) Carbolic acid and corrosive sublimate are said to be especially poisonous to ants, the latter substance rendering them actually insane, if such an expression may be used of these creatures. Among natural checks may be mentioned the ant-lions (*Myrmeleo*), which dig pits for the capture of the ants, at the bottom of which they lie in wait for their victims, toads, and some species of birds.

APPENDIX TO REPORT

OF THE

Commissioner of Agriculture and Arts.

APPENDIX (E).

REPORT OF THE ONTARIO AGRICULTURAL COLLEGE, GUELPH, FOR THE YEAR COMMENCING 1st JANUARY AND ENDING 31st DECEMBER, 1880.

ONTARIO AGRICULTURAL COLLEGE, GUELPH.

REPORT OF THE PRESIDENT

OF THE

ONTARIO AGRICULTURAL COLLEGE,

GUELPH,

FOR THE

YEAR COMMENCING 1st JANUARY AND ENDING 31st DECEMBER,

1880.

Ontario Agricultural College,
Guelph, 31st December, 1880.

To the Honourable S. C. Wood,
Commissioner of Agriculture for the Province of Ontario.

Sir,—I have the honour to submit for your consideration a brief report on the work done in the Ontario Agricultural College during the year 1880, which is the Sixth Annual Report of the institution.

On the 11th February last the Legislature of the Province finally decided to give the College a legal status in the country by passing the following Act, which defines somewhat minutely the objects and scope of what is henceforth to be known as the "Ontario Agricultural College and Experimental Farm":—

No. 60.] BILL. [1880.

An Act respecting the Agricultural College.

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. The School of Agriculture, heretofore established in the county of Wellington, in this Province, for instruction in the theory and practice of agriculture, horticulture and arboriculture, and the conducting of experiments relating thereto, is hereby continued, at its present site, under the name of the "Ontario Agricultural College and Experimental Farm." School of Agriculture continued. Site. Name.

Nature of instruction.

2. The said college shall be furnished with all appliances, such as land buildings, implements, tools and apparatus generally, as may be necessary for theoretical and practical education in agriculture, horticulture and arboriculture, and the course of instruction therein shall be with reference to the following subjects :—

(1) The theory and practice of agriculture :

(2) The theory and practice of horticulture ;

(3) The theory and practice of arboriculture ;

(4) The elements of the various sciences, especially chemistry, (theoretical and practical), applicable to agriculture and horticulture ;

(5) The technical English and mathematical branches requisite for an intelligent and successful performance of the business of agriculture and horticulture ;

(6) The anatomy, physiology, and pathology, of the ordinary farm animals ; with the characteristics of the different varieties of each kind ; with the management thereof in the breeding, raising, fattening, and marketing of each, and with a knowledge of the cheese and butter factory systems ;

(7) The principles of construction and skilful use of the different varieties of buildings, fences, drainage systems, and other permanent improvements, machinery, implements, tools and appliances necessary in agricultural and horticultural pursuits ;

(8) And such other subjects as will promote a knowledge of the theory and practice of agriculture, horticulture and arboriculture.

Practical education insisted upon.

3. The education and instruction shall be at once theoretical and practical, the former known as a course of study and the latter as a course of apprenticeship ; and a time, not less than three and not more than five hours daily, on a yearly average, shall be spent in undergoing the latter, and for the encouragement of such labours, an allowance in part liquidation of expenses may be made ; yet, notwithstanding, the course of apprenticeship may be dispensed with, if a satisfactory examination be previously passed in all the operations therein required.

Nature of experiments.

4. Experiments with the different varieties of cereals, grasses, and roots ; of trees, plants, shrubs, flowers, and fruits ; with different modes of cultivation ; with different manures ; with the breeding, raising, and fattening of animals ; with the products of the dairy ; and with whatsoever else may be of practical benefit in adding to the knowledge of the facts, principles and laws of the science and art of agriculture, horticulture, and arboriculture under the climatic conditions of this Province, shall be carried out on the experimental farm ; and the modes of procedure and results published from time to time.

Publication of procedure and results.

Rules, regulations and curriculum of the College.

5. The government of the college shall be under and according to such rules and regulations as the Lieutenant-Governor in Council may from time to time prescribe ; and such rules and regulations shall contain provisions for the standard and mode of admission, the course of study, and apprenticeship in each branch in which instruction is given, and may authorize diplomas, certificates of proficiency, scholarships, or other rewards to be given, after examination, in any of such subjects ; and may also impose reasonable fees for attendance.

Appointments to be made by the Lieutenant-Governor in Council.

6. The Lieutenant-Governor in Council may from time to time appoint a president and such professors, instructors, officers, assistants, and servants as the Lieutenant-Governor in Council may deem necessary for the efficient working of said college, and the promotion of its usefulness, and may pass by-laws regulating and prescribing their respective duties.

Sessions, terms and vacations.

7. There shall be two sessions in each year, and two terms in each session; the winter session shall open on the first day of October, and close on the thirty-first day of March; the summer session shall open on the sixteenth day of April, and close on the thirty-first day of August; and the time between the closing and opening of the respective sessions shall constitute the regular vacations.

Affiliation of the College with the University of Toronto.

8. The Lieutenant-Governor in Council may agree with the University of Toronto for the affiliation of the said College with the said University, but only to the extent of enabling the students of the said college to obtain at the examinations of the said university such rewards, honours, standing, scholarships, diplomas and degrees in agriculture as the said university, under its statutes and the Acts of the Legislature in that behalf, may be allowed to confer.

Museum and Laboratory.

9. In connection with the college there shall be a museum of agriculture and horticulture, together with the scientific and technical branches relating thereto, in order to afford aids to practical instruction, and illustrations of the agricultural and horticultural products of the Province; as well as a botanical and chemical laboratory to which vendors of seeds and artificial manures may send such seeds and manures, in order that after the proper inspection and tests their purity and strength may be reported for the benefit and protection of the agricultural community.

Gifts, bequests, &c., to College, Museum or Laboratory.

10. It shall be lawful for the Lieutenant-Governor in Council on behalf of the Province to accept, hold and enjoy any gifts, bequests, or devises of personal or real property or effects which any person may think fit to make for the purposes of the said college, museum or laboratory.

No religious test or profession required; but all facilities given for acquiring religious training.

11. The Lieutenant-Governor in Council may make such regulations as may be deemed expedient touching the conduct of the students, and their attendance on public worship in their respective churches or other places of religious worship, and respecting their religious instruction by their respective ministers, according to their respective forms of religious faith, and every facility shall be afforded for such purposes.

Reports and returns to the Legislative Assembly.

12. Full reports of the progress of the said college and farm shall be annually returned and submitted to the Legislative Assembly, which reports shall, amongst other things, contain:—

(1) A tabular statement with the name and residence of each student attending in each session of the year, together with the name, residence and occupation of the parent or guardian, the number of classes that each student attended, and his progress and efficiency therein;

(2) A return of the professors, instructors and assistants, with a summary of the instruction given by each;

(3) A copy of the examination papers used in the sessional examinations, and the results thereof;

(4) A summary of the operations in the various departments of the farm;

(5) A clear and succinct account of the modes of procedure and results of the various experiments carried on during the year;

(6) A detailed statement of the income and expenditure of the college and farm for the year;

(7) A copy of all rules and regulations made during the year by the Lieutenant-Governor in Council, regarding the standard and mode of admission, the course of study and the course of apprenticeship;

(8) A comparative statement showing the progress of the college and farm from year to year.

In pursuance of the objects stated in the Bill, the work has been carried on conjointly by the Farm Superintendent and myself, each of us being the independent manager of certain departments. The outside departments are—

I. The Farm Department.
II. The Live Stock Department.
III. The Horticultural Department.
IV. The Mechanical Department.
V. The Experimental Department.

These are entirely under the control of the Farm Superintendent, and for a full account of the year's operations in each, I have pleasure in referring to Mr. Brown's exhaustive Report in the second part of this volume. The inside departments comprise—

I. The Course of Instruction in the College.
II. The Boarding House and College Buildings.
III. The Business Department.

For all these I am directly responsible, and having had full charge of them during the past year, I shall now proceed to report briefly under each head.

I. The Course of Instruction in the College.

The regular course of study is one of two years, and embraces the following subjects:

First Year.—*Agriculture, Live Stock, Inorganic Chemistry, Organic Chemistry, Veterinary Anatomy, Veterinary Materia Medica, Zoology, Structural and Physiological Botany, Geology and Physical Geography, English, Book-Keeping, Arithmetic, and Mensuration.*

Second Year.—*Agriculture, Live Stock, Agricultural Chemistry, Veterinary Pathology, Veterinary Surgery and Practice, Systematic and Economic Botany, Entomology, Meteorology, English Literature, Political Economy, Book-Keeping, Mechanics, Levelling and Surveying.*

During the past year, these subjects were taught by a staff of five lecturers, as follows:—

1. *James Mills, M.A., President.*
   (1) English.
   (2) Political Economy.
   (3) Structural and Physiological Botany.
   (4) Zoology.

2. *William Brown, Esq., Gold Medallist of the Highland and Agricultural Society of Scotland.*
   (1) Agriculture.
   (2) Live Stock.

3. *J. Hoyes Panton, M.A.*
   (1) Chemistry—Inorganic, Organic, and Agricultural.
   (2) Geology, Physical Geography, and Meteorology.
   (3) Systematic and Economic Botany.
   (4) Entomology.

4. *E. A. A. Grange*, V.S.—Veterinary Anatomy, Pathology, and Materia Medica, with the Practical Handling and Judging of Horses.

5. *Alexander McTavish—1st Class Provincial Certificate.*
   (1) Arithmetic, Mensuration, Mechanics, Levelling, and Surveying.
   (2) Book-Keeping.

The scholastic year, which begins on 1st October, is divided into two sessions, and each session into two terms:

Sessions.

Winter Session (1st October to 31st March).
Summer Session (16th April to 31st August).

Terms.

Fall Term (1st October to 22nd December).
Winter Term (5th Jan. to 31st March).
Spring Term (16th April to 30th June).
Summer Term (1st July to 31st August).

Lectures commenced on the 1st October and continued throughout the first three terms—from the 1st October to the 30th June. During that time all regular students were engaged in class-room work and manual labour alternately—three hours a day having been spent at the former and from four to five at the latter. To this were added five hours in two weeks for set-up drill and gymnastics under the very efficient drill sergeant of the Wellington Field Battery. So that the daily routine of every student in the Regular Course was—

Lectures, three hours a day (excepting Saturday),
Manual labour, four to five hours a day,
Study under a master, two hours a day,
Drill, one hour a day (for five days of every alternate week),

making from nine to ten hours a day, for nine months of the year, devoted to college and farm work. While the first year students were attending lectures in the College, the second year students were engaged outside. Those that went out to work in the forenoon, came in for lectures in the afternoon, and *vice versa*. Thus the theoretical work inside and the practical work outside went on simultaneously during the fall, winter, and spring terms.

In order to place systematically and clearly before the readers of this report a correct outline of the literary work done in the institution, I have drawn up the following syllabus of the lectures delivered by the professors in the several departments and sub-departments during the scholastic year commencing on the 1st October, 1879, and ending the 31st August, 1880. The work of each term is given separately, and also that of the first and the second year students. The summer term, which is the last in the year, being devoted entirely to work in the outside departments, is omitted from this syllabus, but will be treated of further on.

Outline of Class-Room Work.

(1st October to 30th June.)

First Year.

Fall Term—1st October to 22nd December.

Department 1.—Agriculture.

Introductory.—Ancient and modern agriculture; agricultural literature; arts and sciences affecting agriculture; different kinds of farming.

Reclamation of Land.—Clearing, stumping, stoning, fallowing, etc.

Soils.—Origin and distribution of soil; natural conditions of soil and plant; examination and classification of soils; physical and chemical properties of each kind.

Rotation in Cropping.—Importance and necessity of rotation; principles underlying it; rotations suitable to different kinds of soil; examination and criticism of different systems of rotation.

Buildings.—Location of house, barn and stables; framing a building; stables for horses, sheep and cattle; arrangement of farm buildings.

Implements and Machinery.—Principles in construction of implements and machinery; points to be aimed at; classification, examination, and description of the same.

Miscellaneous.—Roads, lanes, fences, wells, etc.

Department 2.—Science.

Chemical Physics.—Matter, accessory and essential properties of matter; attraction, various kinds of attraction—cohesion, adhesion, capillary, electrical, and chemical; specific gravity; weights and measures; heat, measurement of heat, thermometers, pyrometers, specific and latent heat; sources, nature, and laws of light; spectrum analysis.

Inorganic Chemistry.—Scope of subject; elementary and compound substances; chemical affinity; symbols; nomenclature; combining proportions by weight and by volume; atomic theory; atomicity of the most important elements; oxygen and hydrogen; water—its nature, functions, decomposition and impurities; nitrogen; the atmosphere—its composition, uses, and impurities; ammonia—its sources and uses; nitric acid and its connection with plants; carbon; combustion; carbonic acid and its relation to the animal and the vegetable kingdom; sulphur and its compounds; manufacture and uses of sulphuric acid; phosphorus; phosphoric acid and its importance in agriculture; chlorine—its bleaching properties; bromine; iodine; silicon, etc.

Natural History.—Nature of life; vital force; difference between animals and plants; morphology and physiology; homology and analogy; definition of species; classification; subdivisions of the animal kingdom; characters of the classes and most important orders of *Invertebrates*; general characters of *Vertebrates*; classes and orders, with a brief description of each.

Department 3.—Veterinary Science.

Anatomy and Physiology of the horse, ox, sheep and pig; osseous system, muscular system, syndesmology, plantar system, and odontology.

Department 4.—English.

Lectures on Composition.—The sentence, the paragraph, and the period; capitals and punctuation; style—its qualities and varieties. *Exercises in Composition.*

English Classics.—Committing to memory, and critical study of "Gray's Elegy in a Country Church Yard."

Department 5.—Mathematics.

Arithmetic.—Review of subject, with special reference to farm accounts; tables of weights and measures discussed; compound proportion, interest, discount, stocks and partnership.

Mental Arithmetic.—Calculations in simple rules, fractions, and compound rules.

First Year.

Winter Term—5th January to 31st March.

Department 1.—Agriculture.

Breeding, rearing, and feeding of animals. Points to be considered in deciding what kind of animals to keep.

Horses.—Different breeds of horses, and leading characteristics of each; type of horse required for farm work; breeding, feeding, and general management.

Cattle.—History and characteristics of Shorthorns, Herefords, Polled Angus, Ayrshires, Jerseys, Devons, Galloways, etc.; grade cattle; milch cows—points of a good milch cow; breeding generally, cross breeding, in-and-in breeding; pedigree.

Sheep.—Breeds of sheep generally considered; long-wooled sheep; medium wooled sheep; short-wooled sheep; crosses between different breeds compared; texture, quality, quantity, and uses of different kinds of wool.

Swine.—Characteristics of various breeds; management of sows; stores; bacon curing, etc.

Department 2.—Science.

Inorganic Chemistry.—Subject continued from Fall Term.

Organic Chemistry.—Constitution of organic compounds; alcohols, aldehydes, acids and their derivatives: formic, acetic, oxalic, tartaric, citric, lactic, malic, uric and tannic acids. Constitution of oils and fats—saponification; sugars, starch, cellulose; albuminoids, or flesh formers, and their allies; essential oils; alkaloids—morphine and quinine; classification of organic compounds.

Natural History.—Subject continued—Special study of *Infusoria*, *Scolecida* and *Insecta*. General characters of the *Vertebrates*—the various orders, with morphological and physiological distinctions of each, illustrated by common examples. Special study of the families of the *Aves* containing the insectivorous birds, and the families of the *Mammalia* containing the farm animals.

Department 3.—Veterinary Science.

Veterinary Anatomy.—Anatomy and physiology of the horse, ox, sheep, and pig—digestive system, circulatory system, respiratory system, urinary system, nervous system, sensitive system, generative system, tegumental system.

Department 4.—English.

Lectures on Composition continued.—Common mistakes in speaking and writing discussed and corrected; most important figures of speech defined and illustrated.

Exercises in Composition continued.—Exercises in synthesis; abstracts of speeches and essays; letter writing.

English Classics.—Committing to memory and critical study of Goldsmith's "Traveller."

Department 5.—Mathematics and Book-keeping.

Arithmetic.—Equation of payments: percentage; profit and loss; stocks; partnership; alligation; exchange.

Book-Keeping—Business forms and correspondence; general farm accounts; dairy, field, and garden accounts.

FIRST YEAR.

SPRING TERM.—16TH APRIL TO 30TH JUNE.

Department 1.—Agriculture.

Preparation of Soil—Modes of preparation for different crops, as wheat, barley, oats, rye, peas, maize; modes suited to various kinds of soil.

Seeds and Sowing.—Testing the quality of seed; changing seed; quantity of seed per acre; methods of sowing.

Improvement of Lands.—Ordinary cultivation; subsoiling in some cases; fallowing; draining; manuring. Farm yard manure, and management of the same; the properties, application and uses of artificial manures—lime, plaster, salt, bone-dust, superphosphates, etc.

Roots.—Cultivation of roots and tubers—turnips, mangolds, carrots, potatoes; effects of each kind on soil.

Green Fodders.—Tares, lucerne, sainfoin, prickly comfrey, clovers, grasses; the cultivation and management most appropriate for each.

Management of pastures; harvesting and preparing crops for market or one's own use; crops of current year examined.

Department 2.—Science.

Geology.—Connection between geology and agriculture; classification of rocks—their origin and mode of formation, changes which they have undergone after deposition; fossils—their origin, inferences from their presence in rocks; geological periods and the characteristics of each. Geology of Canada, with special reference to the nature and economic value of the rock deposits; glacial period and its influence in the formation of soil. Lectures illustrated by numerous diagrams and specimens.

Physical Geography.—Scope of the subject—earth's place in space, external and internal conditions, atmosphere, ocean, land; superficial configuration of Ontario; theory of springs; classification of lakes; zones of animal and vegetable life.

Botany.—Structural and physiological botany; internal structure of plants—cells and vessels; structure and development of the external parts of plants—root, stem, leaf, flower, seed, fruit; physiology of cells and vessels—chlorophyll, starch, gum, sugar, crystals, etc.; movements of fluids in plants, respiration, nutrition, reproduction; hybridization; modes of propagation; propagation of *varieties* by grafting, budding, layering, and division; diseases of plants—smut, rust, mildew, etc.

Department 3.—Veterinary Science.

Materia Medica.—The preparation, doses, action, and uses of about one hundred of the principal medicines used in veterinary practice.

Department 4.—English.

Lectures on the subject, and class-room exercises in business correspondence, etc.

English Classics.—Committing to memory and critical study of Scott's "Lady of the Lake."

Department 5.—Mathematics.

Mensuration.—Mensuration of surfaces—the square, rectangle, triangle, trapezoid, regular polygon, circle, sector, segment, etc. Special application to the measurement of lumber. Mensuration of solids—tetrahedron, cube, prism, cylinder, spherical segment, spherical zone, parabolid, frustum of parabolid, spheroid, circular segment of spheroid, etc. Special application to the measurement of timber, earth, etc.

SECOND YEAR.

FALL TERM—1ST OCTOBER TO 22ND DECEMBER.

Department 1.—Agriculture.

Experimental Plots.—The results of last season's experiments with wheat, oats, barley, pease, grasses, clovers, roots, etc.; liability to disease; effects of various manures on different crops; growth of plants, etc.

Farm Management.—Detailed account of the treatment of each field: results from different kinds of seed and soil; effects of manure; harvesting, storing, and threshing of crops; fall ploughing; subsoiling, etc.

Stock-Feeding—Value of feeding materials; estimate for winter keep of live stock; housing, feeding, and fattening; points to be observed in selecting animals for fattening; feeding experiments; common diseases of animals; management of animals on pasture; value of green fodder. Dairy management and cheese-making.

Department 2.—Science.

Agricultural Chemistry.—Connection between chemistry and agriculture; the various compounds which enter into the composition of the bodies of animals; the chemical changes which food undergoes during digestion; chemical changes which occur during the decomposition of the bodies of animals at death; the functions of animals and plants contrasted; food of plants, and whence derived; origin and nature of soils; classification of soils; causes of unproductiveness in soil and how detected; composition of different plants in relation to the soils upon which they grow; rotation of crops; preservation, development, and renovation of soils; manures classified, the chemical action of manures on different soils; chemical theories in reference to the action of superphosphates; the action of lime in the decomposition of double silicates; feeding of animals; classification of foods; chemical results in the use of different foods; points necessary to be considered in order to obtain the full value of artificial and natural foods.

Meteorology.—Relation of Meteorology to Agriculture; composition and movements of the atmosphere; nature and manipulation of the barometer, its importance in forecasting the weather; temperature, description of the various instruments used in its measurement and how to use them; solar and terrestrial radiation; the influence of forests on climate; mists, fogs, clouds, rain, hail, and snow; description of instruments used in measuring rain and snow fall; velocity and direction of wind; causes affecting climate; influence of climate on vegetation.

Department 3.—Veterinary Science.

Pathology.—Osseous System—Nature, causes, symptoms, and treatment of diseases of bone, as splint, spavin, ringbone, etc.

Muscular System—Nature, causes, and treatment of flesh-wounds, etc.

Syndesmology—Nature, causes, symptoms, and treatment of bog-spavin, curb, and, other diseases of the joints.

Plantar System—Nature, causes, symptoms, and treatment of corns, sand-crack, founder, and other diseases of the foot.

Odontology—Diseases of the teeth and treatment of the same.

Department 4.—English.

Lectures.—Etymological, syntactical, and rhetorical forms of the English language; history of its formation, its connection with other languages; rhetorical figures; their use and abuse; prose and poetic diction.

Composition.—Essay writing; familiar and business correspondence.

English Classics.—Critical study of Shakespeare's "Julius Cæsar."

Department 5.—Mathematics.

Statics.—The mechanical powers; friction; the steam engine; strength of materials; units of work; etc.

Drainage.—General principles; discharging water-ways; how, where, and when to commence draining; depth of drains and distance apart; furrow drains; draining followed by other improvements; drainage implements; levelling.

SECOND YEAR.

WINTER TERM.—5TH JANUARY TO 31ST MARCH.

Department 1.—Agriculture.

Laws affecting agriculture; capital required in farming; laying out of farm; general management and economy; measuring, levelling and draining; permanent pastures; inventory and valuation; cost of production; buying, selling, and marketing; field experiments.

Management of cattle, sheep and other animals in winter; breeding generally considered; special management of ewes before, during, and after the season of lambing; treatment of other animals in parturition; rearing of lambs, calves, and pigs; washing and dipping sheep, etc., etc.,

Arboriculture.—Planting and attendance of forest trees, shade trees, etc.

Department 2.—Science.

Agricultural Chemistry.—Subject continued from Fall Term.

Entomology.—Anatomy of insects; geographical distribution and classification of insects; metemorphosis of insects; insects injurious to vegetation, their habits and the best methods of checking and preventing their ravages—all illustrated by a good collection of specimens.

Department 3.—Veterinary Science.

Digestive system—nature, causes, symptoms and treatment of spasmodic and flatulent colic, inflammation of the bowels, acute indigestion, tympanitis in cattle, impaction of the rumen, and many other common diseases.

Circulatory system—description of the diseases of the heart and blood vessels.

Respiratory system—nature, causes, symptoms, and treatment of catarrh, nasal-gleet, roaring, bronchitis; pleurisy, inflammation of the lungs, etc.

Urinary system—nature, causes, symptoms, and treatment of inflammation of the kidneys, etc.

Nervous system—nature, causes, symptoms, and treatment of lock-jaw, string-halt, etc.

Sensitive system—nature, causes, symptoms, and treatment of the diseases of the eye and ear.

Generative system—nature, causes, symptoms, and treatment of abortion, milk-fever, etc.

Tegumental system—nature, causes, symptoms, and treatment of scratches, sallenders, mallenders, parasites, and other diseases of the skin.

Department 4.—English and Political Economy.

Lectures.—Lectures on accuracy, purity, propriety, clearness, precision, strength, and grace; varieties of style described; false syntax discussed and corrected.

Composition.—Exercises in impromptu composition and letter writing continued.

English Classics—The critical study of Shakspeare's "Hamlet."

Political Economy.—Utility; production of wealth—land, labour, capital; division of labour; distribution of wealth; wages; trades-unions; co-operation; money; credit, credit cycles; functions of government; taxation; etc.

Department 5.—Mathematics.

Dynamics.—Motion, forces producing motion, momentum, etc.
Hydrostatics.—Transmission of pressure; the hydraulic press; specific gravity, density; pumps, siphons, etc.
Road-Making.

SECOND YEAR.

SPRING TERM. 16TH APRIL TO 30TH JUNE.

Department 1.—Agriculture.

Review of all past lectures with special drill on outside work. Reasons for management, etc.

Department 2.—Science.

Systematic and Economic Botany.—Subject defined; principles considered in the classification of plants—plants classified; orders containing the plants of greatest importance to the agriculturist described; plants classified in regard to their economic value for food, medicine, fabrics, forage, timber, etc. The course illustrated by a large collection of well preserved plants.
Practical and Analytical Chemistry.—Chemical manipulation, preparation of common gases and reagents; operations in analysis—solution, filtration, precipitation, evaporation, distillation, sublimation, ignition, and the use of the blow-pipe; testing of substances by reagents; impurities in water; adulterations in foods and artificial manures; injurious substances in soils.
Quantitative analysis of soils, manures, and farm produce.

Department 3.—Veterinary Science.

Materia Medica.—The preparation, actions, uses, and doses of medicines—continued from the Spring Term of the first year. Lectures on special subjects, such as pleuro-pneumonia, the rinderpest, tuberculosis, etc.

Department 4.—English.

Lectures.—Taste, characteristics of taste, standard of taste; pleasures of the imagination—their sources, viz., the novel, the wonderful, the picturesque, the sublime, the beautiful; wit, humour, ridicule, etc.
Composition.—Business forms and correspondence; general letter-writing, etc.
English Classics.—The critical study of Milton's "L'Allegro" and "Il Penseroso."

Department 5.—Mathematics and Book-keeping.

Surveying.—Fields surveyed with chain and cross-staff; heights and distances found by the theodolite.

Book-Keeping.—Review of previous work; laws relating to farming—deeds, mortgages, notes, etc., with laws relating thereto.

The College Roll, which will be found in Appendix C, gives the names and post-office address of all students who have been in attendance during the year—176 in number—some from Quebec and Nova Scotia, and others from Britain; but the great majority from Ontario. Now, as applicants from Ontario have at different times been refused for want of accommodation, the question is asked why any from abroad have been admitted. This I consider a very reasonable question; and hence I shall explain the why and the wherefore. When applications from Ontario are sent in, I answer them at once, accepting such as are prepared to comply with the terms of admission as laid down in the circular, a copy of which will be found in the first appendix to this report. As regards applications from other provinces or countries, a different course is pursued. They are generally placed on file, and the question of acceptance or refusal postponed till within a few weeks of the entrance examination. If at that time the applicants from Ontario are not sufficient to fill all vacancies, I admit some from abroad, selecting as far as possible those who intend to buy land and settle here. Thus you see our own people always, and in my opinion very properly, get the preference. Vacancies are kept for them till the time arrives when non residents must have a definite answer—yes, or no. If after that—within a few days of the entrance examination, or when it is over—some apply for admission and find all vacancies filled, I think they should not complain.

I may be wrong, but the following reasons seem to me to justify the course pursued:—

1st. It is generally admitted that if a new country would grow and develop its resources rapidly, it must encourage immigration, and even spend a portion of the public funds in order to secure it.

2nd. The Dominion of Canada, and nearly every province in the Dominion, recognizing this fact, has spent, and is still spending large sums of money to induce emigrants from Europe to come and settle here.

3rd. The eyes of Europe are now turned towards this country, and many young men of good standing with moderate means in England, Ireland, Scotland and Wales are disposed to purchase land and settle among us; but before doing so they wish to acquire some knowledge of Canadian farming and the manners and customs of the Canadian people. Hence they apply for admission to the Ontario Agricultural College.

Now, if these propositions are true, and if such young men are a valuable acquisition to our country, I maintain, that in admitting a few of them from time to time, we have in no way injured, but rather benefited the Province of Ontario, especially since according to present regulations they pay cost price for their board and washing, and a fee of $50 a year for tuition.

From the following list it will be seen that the Ontario students are from all parts of the Province. Thirty-one counties and five cities are represented. Of the counties Wellington has the largest number, and Oxford next, while Ottawa has more than any other city, having no less than fifteen representatives. Some, no doubt, will view this as not altogether satisfactory, because they have serious doubts about city boys ever settling down to the life of a Canadian farmer; but to all such I am bound to say that we have no more faithful students than many of the young men from our cities. Their whole work inside and outside shows that they intend to be practical farmers—men who know how both to rule and to be ruled, to work and to superintend.

Counties, &c.	*Students.*	*Counties, &c.*	*Students.*
Bruce	2	Northumberland	1
Brant	4	Ottawa City	15
Carleton	1	Ontario	2
Durham	1	Oxford	11
Elgin	1	Prince Edward	4
Frontenac	3	Prescott	1
Glengarry	2	Perth	6
Grey	5	Peel	2
Hamilton City	5	Peterboro'	1
Halton	4	Renfrew	1
Huron	7	Simcoe	2
Haldimand	2	Toronto City	8
Kingston	1	Victoria	2
Lanark	8	Waterloo	4
Lincoln	3	Wellington	17
London City	1	Welland	1
Middlesex	1	Wentworth	3
Norfolk	3	York	7

Total number in attendance during 1880 176
Number of Ontario counties represented 31

To this may be added a statement showing the extent to which the different religious denominations of the Province, are availing themselves of the advantages offered by the institution.

Religious Denominations.

Episcopalian	60
Presbyterian	55
Canada Methodist	31
Canada Baptist	7
Congregationalist	7
Roman Catholic	6
Primitive Methodist	4
Plymouth Brethren	3
Quaker	2
Lutheran	1
Total	176

Having spoken briefly of the year's operations as a whole, I shall now take the liberty of asking your attention for a short time to the work of each term separately. As already stated, the scholastic year began on the 1st October, 1879, and ended on the 31st August, 1880; but the financial year, on which I have to report, began on 1st January and ends to-day, the 31st December, 1880. Owing to this fact, it is difficult to make our reports intelligible to ordinary readers. The following will, perhaps, illustrate what I mean:—

Scholastic Year— { Fall Term (1879), Winter Term (1880) } *Financial Year.*
{ Spring Term " , Summer Term " , Fall Term " }

From this it can be seen that the financial year embraces the last three terms of one scholastic year and the first term of another. Hence the confusion which arises in the minds of some.

The Fall Term of 1879—the first of the scholastic year, was treated of in last year's report. I shall, therefore, commence with the second term, viz.:

THE WINTER TERM.

5th January to 31st March, 1880.

The students in attendance were those who had entered at the commencement of the Fall Term in October, 1879, or previous to that date—92 in number; and the work was to some extent a continuation of the subjects begun at that time. The first year students received 180 lectures of one hour each on the subjects prescribed for the term—33 on Agriculture and Live Stock, 44 on Organic and Inorganic Chemistry, 22 on Veterinary Anatomy, 24 on English Literature and Composition, 22 on Natural History, 24 on Arithmetic, and 11 on Book-Keeping. At the same time the second year students had a course of 156 lectures and spent 22 hours in handling and judging cattle, sheep, and horses, under the supervision of a professor. The lectures were—20 on Agriculture and Live Stock, 4 on Arboriculture, 33 on Agricultural Chemistry, 22 on Veterinary Pathology, 11 on Entomology, 22 on English Literature, 22 on Political Economy, and 22 on Statics and Drainage. In reference to the "Course of Apprenticeship" in practical work, I may say that the students were sent in rotation to the different departments, *i.e.*, to the Farm, the Live Stock, the Garden, the Carpenter-shop, and the Experimental Department, so that it was in the power of every one to get a fair knowledge of all that is to be learned in each department. During the Winter Term it is always more difficult than at any other time in the year to find enough outside work of a kind suitable for the purposes of instruction; but to meet the difficulty, as much prominence as possible was given to the Mechanical and Live Stock Departments.

Live Stock.

In this department, three hours a week were devoted to the study of cattle, sheep, and pigs. First, the students were taught to point out and name the different parts of an animal, such, for example, as the brisket, crops, loins, flank, hooks, and twist; and for this purpose, a cow or steer was brought into the class-room at almost every lecture, so that each student saw the animal handled and described by the lecturer, and afterwards had the opportunity of handling it himself in presence of his fellow students. The lecturer then proceeded to explain and illustrate what are considered the good points of an animal for beef and for milk, comparing and contrasting Shorthorns, Herefords, Aberdeen Polls, Galloways, Devons, and Ayrshires—breed with breed, in regard to shape of frame, quality, beefing, milking, and other properties. Thus the instruction was made in the strictest sense definite and practical. Much the same course was pursued with the different breeds of sheep—Cotswalds, Leicesters, Southdowns, Oxford Downs, and Shropshire Downs. They were frequently compared with one another as regards carcass, constitution, wool, mutton, feeding, hardiness, etc. Considerable attention was also paid to the feeding, cleaning, and general management of stock in the winter season. In this way the College furnishes a good opportunity for acquiring a thorough knowledge of this very important department.

The Mechanical Department.

Under this head nothing very ambitious has yet been attempted. As you are aware, we have quite a plain shop, with three or four work-benches and an outfit of such tools as are required for repairing and general carpenter-work. Students are sent regularly to this department as to all the others. They are at first taught the use of the different tools, and afterwards employed in doing a variety of work such as is constantly needed on a farm—making gates, waggon tongues, whipple trees, etc., and repairing a countless number of things about the College and farm buildings. Such is the regular rou-

tine of the department, and last winter was no exception to the general rule. In the department of

Natural Science

considerable progress was made, but the results would have been better and much more satisfactory to all concerned, if the institution had been provided with a good laboratory and apparatus suitable for making the experiments which constitute so large a part of the instruction in this important department. The Professor of Chemistry did all that any chemist could do, but he was much hindered by the utter insufficiency of our eight by twelve laboratory and its scanty equipment. The first year students, after completing the Inorganic Chemistry which they had studied throughout the Fall Term, took up the somewhat difficult but interesting subject of Organic Chemistry. A full course of lectures was delivered, embracing all the important organic compounds; but special attention was paid to the nature and sources of sugar, starch, oils, fats, the albuminoids or flesh-formers, and other substances which have a more or less direct bearing on agriculture and stock-raising. At the same time they received lectures from another professor on Zoology, the object of which was to give them a general view of the whole animal kingdom, and thus make them more intelligent and appreciative students of particular parts of that kingdom under the heads of Entomology and Veterinary Science. While the students of the first year were thus employed, those of the second year were attending lectures on Agricultural Chemistry and Entomology. During the previous term they had learned the close connection between Chemistry and Agriculture, and with this knowledge they now proceeded to study the nature and sources of plant food, the origin and properties of the different kinds of soil, their preservation and renovation, the causes of unproductiveness, artificial fertilizers and farm-yard manure, the chemical composition of various fodders, and the nutritive value of each. With such subjects as these, they were occupied three hours a week, and spent one hour a week in examining specimens of the various insects which infest our crops and fruits, and in studying the best known means of preventing their ravages.

Veterinary Science.

As will be seen from the syllabus of lectures given on a previous page, the Winter Term in the Veterinary Department is devoted to the anatomy, physiology, and pathology of what we call the farm animals—the horse, ox, sheep and pig. The lectures to the first year students were on the anatomy and physiology of these animals, and were illustrated by the complete skeleton of a horse and portions of other skeletons. Those delivered to the students of the second year, discussed various diseases and their treatment, especially of the horse; as, spavin, ringbone, curb, founder, inflammation, and such like. Here again, for the purpose of making the instruction as definite and practical as possible, horses were regularly brought into the class-room and examined, first by the professor in presence of the class, and afterwards by some of the students. Thus the Veterinary Surgeon was each day enabled to see whether his lectures were really understood by those to whom they were delivered. This part of the work I am pleased to say, was heartily entered into and much appreciated by the second year men.

English and Political Economy.

The Ontario Agricultural College has never failed to give special prominence to agriculture, live stock, and one or two other branches, which some would call the dollar-and-cent, and hence, the only important subjects in a farmer's education. Notwithstanding the example set by most of the American agricultural institutions, our College has strictly and persistently confined its course of study to those branches which have a somewhat direct bearing on the ordinary duties of the average Canadian farmer. This, I think, is right, and may fairly be urged as one of the reasons for the existence of the institution—a place where any young man who intends to follow farming can get instruction in those subjects which he constantly requires in the discharge of the neces-

sary duties of his occupation, and that, too, without being compelled to spend a large portion of his time in studying foreign languages, or anything else which has only a very remote bearing on his life work. While speaking thus, I am not amongst those who would confine a farmer's education within too narrow limits; and my reason for introducing the matter here is to enter an emphatic protest against the vicious idea which has somewhere been instilled into a number of the young men who come here to study—that even English should be excluded from our programme. Some, when they first arrive, are not only unable to speak or write correct English, but have apparently made up their minds that they will not study it or any other subject, unless you can first prove to them that it will put so many dollars into their pockets within a given time.

We want a broader culture for the farmers of this country—something that will raise them above the level of mere drudges, and fit them for filling respectable and influential positions in the state.

> "For just experience tells, in every soil,
> That those who think must govern those that toil."

Hence, we insist on their sons devoting a portion of their time to the study of English literature and composition, as well as to the bread-and-butter subjects of the curriculum; and not unfrequently, I am sorry to say, we do so in the face of very marked and provoking indifference. During the winter term of last year all our students wrote letters, essays, and impromptu compositions; and spent two hours a week in the critical study of English classics—the first year men having read Goldsmith's "Traveller," and the second year, Shakespeare's "Julius Cæsar." Towards the end of the term the indifference gave way, and the subject was entered into with considerable interest and profit.

During this term also, the second year students gave considerable attention to the study of Political Economy. I believe there was not one in the class who did not enter into the subject with an earnest desire to learn at least some of the great problems connected with land, labour and capital. Nearly every one entered heartily into the discussion of such questions as the division of labour, protection and free trade, the functions of government, etc.; and the result was that the subject proved to be one of much interest and not a little profit to all concerned.

Mathematics and Book-Keeping.

In this department, the first year students commenced the study of book-keeping on the 5th of January, and continued that of arithmetic from the Fall Term. In the former, the master in charge having devoted special attention to the subject, gave several valuable lectures and a number of important exercises on what may be called farm book-keeping—farm, field, garden and dairy accounts; in the latter, particular stress was laid on the commercial part of the subject, and the solution of such problems as are required in the business of the farming community. At the same time, the second year students were engaged in the study of dynamics, hydrostatics, and road-making. The principles learned in hydraulics were applied in studying the construction and working of pumps, siphons, hydraulic rams and presses; and under the head of road making, several matters of importance were discussed, such as road materials, the construction of various kinds of roads, lanes, and walks—macadamized, gravel, plank, etc.; also the relative cost and value of each, under a variety of conditions. In this way the young men were interested in what might appear a very common place subject, and were led to see how our country roads might be much improved, without any additional expenditure, if the principles of grading and drainage were generally understood and acted upon.

Special Course.

During the first three terms of the year, 1st October to 30th June, as already explained, the students in the regular course had lectures and manual labour alternately;

during the last term, embracing the months of July and August, they had nothing but manual labour. There is also a special course for the convenience of farmers' sons who wish to attend lectures during the fall and winter months, and return home about the 1st April, in time for the spring work on their own farms. Such students, doing little or no outside work, are able to take in two terms all the lectures that the regular students get in three terms. The following will, perhaps, show what I mean :—

Regular Students.

Fall Term—1st Oct. to 22nd Dec.
Winter Term—5th Jan. to 31st Mar.
Spring Term—16th April to 30th June. } Lectures half-day and work half-day, alternately.
Summer Term—1st July to 31st Aug.—Work all day on "Experimental Farm."

Special Students.

Fall Term—1st October to 22nd December } Lectures six hours a day.
Winter Term—5th January to 31st March }
Spring Term—16th April to 30th June } Work at home.
Summer Term—1st July to 31st August }

Last fall and winter we had ten young men in this course—five first and five second year men. One half of the day, they took lectures with the regular students of their year; the other half, when the regulars were engaged outside, they (the specials) had lectures by themselves on the work of the Spring Term. Thus, by omitting the practical work, they were enabled, during the fall and winter terms, to take not only the lectures of those terms, but also the lectures of the Spring Term as well. In appendix B, the "Special Time-table" will be found, shewing the lectures delivered to the first and the second year specials on the work of the Spring Term. The "Regular Time-table" in the same appendix, shows the work which they did with the ordinary students in the Fall Term.

Easter Examination.

Just before Christmas, 1879, we held a written examination with printed questions on the work of the preceding term, and at Easter on that of the two preceding terms. The latter examination commenced on the 18th March, and continued till the end of the month. The questions set on that occasion will be found in appendix D. I think they are sufficiently close and comprehensive to test the knowledge of the best student, and at the same time give all a fair chance to pass. The answers were carefully valued, and the candidates arranged in three classes according to the percentage of marks taken.

100 per cent. down to 67 per cent..... ....1st class honours.
66 " " " 50 " " .....2nd class honours.
49 " " " 33 " " ....3rd class or passed.
All below 33 " " ...."plucked."

For the results of the examination, I would refer to the class-lists in appendix E. There, a full record of all the candidates will be found—not only those who passed or obtained honours, but also those who failed. About ten per cent. of the first year and nineteen per cent. of the second, got first-class honours. A small percentage failed.

One feature of this examination was, I believe, entirely new; and owing to its manifest importance I beg leave to call your attention to it more particularly—that is, the *practical* examination in the Department of Live Stock. After the students of the first year had spent eight hours, and those of the second year seven hours, in writing out answers to questions on Agriculture and Live Stock, they were all subjected to an oral examination on cattle and sheep, which lasted for three days. The examination of

the first year students on cattle occupied a day, and that on sheep a day; the second year students, being less numerous, got through both cattle and sheep in one day. Three cattle of different breeds were taken into a room which was provided with fodder and bedding for the purpose. Mr. Brown and myself took charge of the examination. The students were sent in one by one from an adjoining room. Each was allowed a certain number of minutes to handle the animals and answer the questions found in appendix D, under the head of "Practical Examination on Live Stock." When his time was up, he passed out and another took his place." The same course was pursued with the sheep; and though it was fatiguing to both students and examiners, nevertheless all felt satisfied that no other part of the session's work was so well adapted to fit young men for discharging intelligently and promptly the duties of a buyer in a stock-yard, or a judge in a show-ring.

In order that our readers may the more clearly understand the nature of this practical examination, I shall quote the questions from the appendix before referred to—

SESSIONAL EXAMINATIONS—EASTER, 1880.

Practical Examinations in Live Stock.

Examiners: *Wm. Brown, Esq., and James Mills, M.A.*

First Year.

Cattle.

Animals examined: Shorthorn Bull; Ayrshire Cow; Shorthorn Grade Cow.

1. Show the weak points of the Shorthorn.
2. What are his best points?
3. What are the indications in this bull of good beefing properties?
4. Judge the Ayrshire cow as a milker.
5. Which of the cows would mate best the bull for beefing purposes, and why?

Sheep.

Animals examined: Leicester Ram; Cotswold Ram; Southdown Ram (1); Southdown Ram (2); Oxford Down Ram; Oxford Down Grade Wether.

1. Distinguish the characteristic points of the Leicester and Cotswold.
2. Which is the best long wooled fleece of the lot as regards density and soundness?
3. Which is the oldest and youngest sheep of the lot?
4. Compare the wether with the Oxford Down, and say wherein they agree or differ as regards carcass and wool.
5. Judge the oldest Southdown by the standard used for the breed.

Second Year.

Cattle.

Animals examined: Shorthorn Steer; Galloway Steer; Grade Cow.

1. Describe the Shorthorn with reference to five most important qualities for fattening purposes.

2. Point out the four greatest defects in the same animal.

3. Handle and describe the weakest point and the best point of the frame of the Galloway for carrying beef.

4. Judge and decide upon the relative merits of the two steers as regards quality and evenness of flesh.

5. Show the five best indications in this cow as a milker.

Sheep.

Animals examined: Leicester Ram. Cotswold Ram. Southdown Ram (1). Southdown Ram (2). Oxford Down Grade Wether.

1. Show wherein one Southdown is superior to the other.

2. Which is the oldest and the youngest sheep of the lot?

3. Judge the Oxford grade wether, and compare him with the Leicester standard of points.

4. Explain the principal points of difference between the frame of the Cotswold and that of the Leicester.

5. Which is the best wooled sheep of the lot, as regards uniformity and lustre?

Closing Exercises.

As a fitting conclusion to the work of the session, a number of friends from Guelph and the surrounding country met at the College to witness the closing exercises. Among others present were James Laidlaw, M.P.P.; Thos. Ballantyne, M.P.P.; and Wm. Johnston, M.A., ex-president of the College. Short addresses were delivered by a number of gentlemen, and the honour certificates presented by others; but the chief feature of the exercises was the presentation of the prizes by the Hon. Oliver Mowat, who did us the honour of coming to Guelph for that purpose, and also, no doubt, to acquaint himself more fully with the working of the College. I need scarcely add that his address to those assembled in the afternoon, and words of counsel to the young men in the evening, were much appreciated by all who heard them. Such visits by members of the Government are undoubtedly a benefit to the institution.

PRIZE LIST.

Ontario Agricultural College.

Easter Examination, March, 1880.

First Year.

Agriculture and Live Stock.—1st, W. Howitt; 2nd, W. Motherwell.
Chemistry and Zoology.—1st, W. Motherwell; 2nd, J. G. Ross.
Geology and Botany.—1st, W. Howitt; 2nd C. S. Dickinson.
Veterinary Anotomy.—1st, R. J. Phin; 2nd W. Motherwell.
Veterinary Materia Medica.—1st, J. G. Ross.
English Literature and Composition.—1st, W. Howitt; 2nd, J. G. Ross.
Arithmetic and Book-Keeping.—1st, W. Motherwell; 2nd, J. G. Ross.
Mensuration.—1st, W. Howitt and J. G. Ross; 3rd, W. Horne.
General Proficiency.—1st, W. Motherwell and W. Howitt; 3rd, J. G. Ross; 4th, R. J. Phin; 5th, W. E. Phin.

SECOND YEAR.

Agriculture and Live Stock.—1st, W. Ash; 2nd, R. F. Holterman; 3rd, H. Joyce.

Agricultural Chemistry, Meteorology, and Geology.—1st, J. L. Webster; 2nd, R. K. Chapman.

Practical Chemistry and Economic Botany.—1st, J. L. Webster; 2nd, R. K. Chapman.

Veterinary Pathology.—1st, W. Ash and A. H. Clutton.

English Literature, Composition, and Political Economy.—1st, J. L. Webster and H. R. Macaulay; 3rd, R. F. Holterman.

Mechanics, Levelling and Surveying, Book-Keeping.—1st, J. L. Webster; 2nd, H. R. Macaulay.

General Proficiency.—1st, J. L. Webster; 2nd, R. F. Holterman and H. R. Macaulay; 4th, J. Lomas.

SPECIAL PRIZE.

Sheep-Shearing.—1st, W. Ash; 2nd, A. H. Clutton; 3rd, M. A. Dawes.

THE SPRING TERM.

16TH APRIL TO 30TH JUNE.

Those in the special course, and generally a few others, leave at Easter. Hence it has been found necessary heretofore, to hold two entrance examinations in the year, one on the first of October and another on the 16th of April. To fill the places of those who left last Easter, sixteen were selected from a large number of applicants. They were examined on the 16th and 17th of April. Lectures commenced on the 18th.

As the spring term affords special opportunities for practice in the outside departments, the class-room work did not receive quite so much attention as during the winter term. Every one had to attend lectures three hours a day as usual; but a little less time was occupied in study than during the winter months. Five hours a day were devoted to practical work outside, a part of which was spent under the instructor, and the balance with the foremen of the several departments. By the instructor, I mean one of our men who spends his whole time in teaching the students how to perform such operations as they require to understand before taking full charge of a farm—harnessing and driving horses, ploughing, sowing, harrowing, rolling, mowing with scythe, driving a mower, and such like. The young men are sent to him in rotation, according to our knowledge of what they require; and while under his instruction they get no wages. Hence they are generally anxious to learn as quickly as possible, so that they may be in a position to claim the promised pay for their work.

While particular prominence was given to practical work outside, the theoretical work inside was by no means neglected. In the department of Agriculture the cultivation of the various crops was taken up; seeds were examined and judged; the different modes of sowing discussed and exemplified; the principles underlying rotation, and the rotations suitable to different soils, climates, and circumstances were explained; also the improvement of land by ordinary cultivation, subsoiling, fallowing, manuring, and laying down to grass. At the same time, under the head of Practical and Analytical Chemistry, the second year men were employed three to four hours a week in the laboratory, examining and testing waters, soils, foods, manures, and samples of farm produce. They now saw the practical value of what they had already learned in inorganic, organic, and agricultural chemistry. They had opportunities for putting their knowledge to a practical test; and hence they entered cheerfully and heartily into the work. So far all right; but the more earnest and anxious the students became, the more Mr. Panton, our Professor of Chemistry, felt himself hampered by the want of accommodation and proper appliances in the little room which has been dignified with the name of "Laboratory." In Systematic and Economic Botany they received lectures on the general classification of plants, and studied more particularly those orders which contain the most important agricultural and economic plants—cereals, grasses, roots, and plants used in the manu-

facture of fabrics, oils, medicines, and other articles of commerce. At the same time the first year students were attending lectures on Geology and Botany. In the former they learned something about the formation, composition, and character of the soils found in the country; in the latter, they studied the plant in relation to the soil and the atmosphere—its form, food, functions, and diseases, giving special attention to hybridization, the different modes of propagation, and such diseases as smut, rust, mildew, etc. The lectures of the class-room were illustrated and applied as far as possible by the garden foreman while the students were at work with him in the hot-houses, gardens, and lawns. In the departments of Veterinary Science, English, and Mathematics, the work was carried on as during the winter term. The first year students had twenty-four lectures on the preparation, action, and doses of about fifty kinds of medicine commonly used in veterinary practice; read critically three cantos of Sir Walter Scott's "Lady of the Lake;" wrote familiar and business letters; began the study of Mensuration; and continued that of Book-keeping from the previous term. During the same time, the second year men took lectures on twenty-five or thirty additional medicines and the therapeutics of the veterinary art; read Shakspeare's "Macbeth," and committed to memory the best passages; gave some attention to farm book-keeping; and went twice a week into the fields with the master in charge to apply what they had previously been taught under the heads of levelling, surveying, and drainage. The term closed with a four days' written examination on the class-room work and a practical examination on various operations in the outside departments.

The time had now arrived when it was necessary to decide who was entitled to the silver medal which His Excellency the Governor-General had offered nine months previous, for competition among the students of the second year.

The Governor-General's Silver Medal.

The terms of competition were as follows:—

"1. All competitors must be second year students.

"2. They shall compete—

"(1) By a written examination at Easter on all the class-room work of the Fall and Winter Terms.

"(2) By a similar written examination at the end of June on all the class-room work of the Spring Term.

"(3) By practical examinations at the above dates on cattle, sheep, pigs, horses, and the various operations taught or performed on the farm, in the garden or in the carpenter shop.

"3. The successful competitor must reach the required standard in the Inside and the Outside Departments separately, that is, must make at least thirty-three per cent. of the marks in each subject, and an aggregate of not less than sixty-seven per cent. of the total number of marks in all the subjects prescribed for second year students."

Three competitors strove vigorously for the prize. The competition was particularly keen and close between J. L. Webster, of Yarmouth, Nova Scotia, and R. F. Holterman, of Toronto, but without any sign of ill-feeling or any disposition to do aught but what was honourable. The final tests in the outside work took place about the middle of the Summer Term. Mr. Webster came out a little ahead and won the medal, which was presented on the 26th day of August by Professor Buckland of Toronto University.

Side-walk to the City.

The College is distant a little over a mile from the city of Guelph. The road leading thereto is muddy and unpleasant during the fall and spring. The officers and students not only do business, but attend church and Sabbath-school in the city. Hence the want of a side-walk had long been felt by those connected with the College, and also by many of the citizens who frequently visit the College and Farm. Knowing this, I sent a formal request to the City Council, asking them to build the walk. Before the meeting, I called on several of the leading aldermen privately, and laid our wants and claims

before them. The result was that they agreed to lay a four-foot walk to the city limits, if we would lay it from that point to the College. The offer was accepted with your consent, and in about two weeks from the commencement of the Spring Term the work was completed. The College and the Council met at the city limits. We have been on better terms ever since; and the unanimous verdict is that the money was well spent.

Visitors.

There is not, I believe, another public institution in the country that has so many visitors as the Ontario Agricultural College. We have them from near and from far, from home and abroad, from this land and other lands. I am safe in saying that between 8,000 and 9,000 people visited us last year. Some came from curiosity, some to learn what they could, and others to inquire into our course of study and the *modus operandi* of the institution. Ordinary visitors average not less than twenty a day, and occasionally we have large parties from different sections of the Province. On the 22nd, 23rd and 24th of June last we had four excursions, numbering 2,600 people, from the counties of Perth, Huron, Bruce, Ontario and York, under the auspices of the Prince Albert, Lucknow, North Bruce, and Ontario Division Granges. Such visits from the farming community show clearly that the interest in the College and Farm throughout the Province is increasing. Some criticised severely, and others professed to be well pleased; but all united in saying that the Government should support the institution liberally and make it as efficient as possible. Not only so, but without either hint or solicitation every one of the four excursions passed resolutions to that effect.

Many erroneous notions about the College exist among some of our farmers; and one is that regarding their relation to the maintenance of the institution. They are quite willing that the Government should vote hundreds of thousands for the support of asylums, prisons, and reformatories; and they do not seem to enquire very closely whether the money voted for such institutions is properly expended or not. But every dollar spent on the Ontario Agricultural College and Experimental Farm they regard as a direct addition to their taxes, and hence oppose the whole concern, whatever it may do or leave undone. They are surprised and incredulous when told that it has not affected their taxes to the amount of one cent in the last five years, and that they would not pay a farthing less, if it were blotted out of existence to-morrow. Gradually, however, the idea is gaining ground that the interest of the country at large and especially of the farmers is, not to destroy, injure, or cripple the College, but to correct what needs correction and make it thoroughly efficient in every particular. Personally, I have no objection whatever to fair and honest criticism; it is always helpful. If we were not criticised we might grow careless. The Farm was purchased and the College established to promote the interests of Agriculture and Stock-raising in the Province. Therefore, farmers more than any other class have a right to visit the institution, inquire into its working, criticise, and make suggestions from time to time. Those who have done so are generally our best friends. Mistakes have been corrected and prejudices removed.

THE SUMMER TERM.

1st July to 31st August.

At the close of the Spring Term (30th June), when the year's lectures were over, several farmers' sons were allowed to return home to labour on their own or their fathers' farms in haying and harvest. Some forty-five remained with us to work ten hours a day during the Summer Term (July and August). As at all other times, they were sent in rotation to the several departments, giving, of course, the largest share of their time where it was most needed, *i.e.*, on the Farm. I shall not weary you with a detailed account of the routine in each department, but simply say that the young men received instruction in the fields, the yards, the gardens, and the shop. They spent a portion of their time in a special class for the purpose, learning how to dig, plough, harrow, sow, shear sheep, mow, cradle, drive a reaper, bind, shock, and such like; and in addition

did all that is to be done in the summer months on a large grain and stock farm, and in the management of a large vegetable garden, flower garden, orchard, and lawn.

Our visitors in the month of June were chiefly farmers; but in July and August, as might be expected, they were largely of other classes. Between six and seven hundred Masons and Oddfellows did us the honour of spending a short time with us. They took a hasty run over the premises and generally expressed themselves as well pleased with what is being done.

The term closed on the 26th day of August with the Annual Atheletic Sports, which have come to be regarded as one of the most interesting exercises in connection with the institution. For several weeks before the day fixed upon, the young men occupied their evenings on the college campus in practising those manly exercises which did so much to give character and muscle to the ancient Greeks at Olympia on the far-famed banks of the Alpheus. Everything objectionable was excluded from the games, so that the most fastidious could not find fault. The day was rather cold, but nevertheless over 1,000 of the leading people from Guelph and the surrounding neighbourhood spent the afternoon in viewing the various tests of strength and speed. After the games came the *Harvest Home Procession* around the College grounds, and the presentation of the prizes by Professor Buckland of Toronto University, Wm. Johnston, M.A., and the President of the College. Thus terminated what I think I may venture to call a successful year in the history of the Ontario Agricultural College and Experimental Farm.

THE FALL TERM.

1st October to 22nd December.

The question of charging a fee for admission to the College was formally laid before the Government on the 21st July; and in a few days thereafter it was decided that ratepayers and *bona fide* residents of the Province of Ontario should henceforth pay a tuition fee of $25 a year, and non-residents $50 a year in advance, students who had already entered the College being allowed to complete their course without payment. All applicants for admission were at once notified, and requested to inform me without delay whether they wished their applications to stand on the changed terms of admission. I feared that the imposition of the fee, though a small one, would materially affect the attendance, for a time at least. I am glad to say, however, that my fears proved to be groundless; for in the month of August alone, I received applications enough to fill all vacancies, and from that till the time of opening I had to refuse quite a number for want of accommodation. During the month of September we had as much to do as at any other time in the year. Carpenters, masons, plasterers, steam-fitters, and plumbers were at work in all parts of the building, tearing down, building up, and making additions. I watched the job late and early. The old parts of the building were to be repaired, whitewashed, and cleaned; and the new parts to be fitted up, scrubbed, and furnished for between forty and fifty additional students. Notwithstanding my best efforts, things seemed to move very slowly. I appealed, urged and entreated, till about the 24th September, when it became evident that we could not get possession of the building on the 1st of October. So I wrote to the old students and the new applicants for admission, informing them of your decision to postpone the opening from the 1st to the 30th October. In the meantime I purchased an additional range for the kitchen; chairs, tables, and table-ware for the dining-room; beds, bedding, and furniture for the new dormitories; and ten stoves to heat the building till the steam-fitters would be through with their part of the contract.

Matriculation Examination.

On the 30th of October, 62 old students returned, and 68 new ones came up for the matriculation examination, which commenced on the 1st and continued till the evening of the 2nd of November. The papers set were not difficult; copies of them will be found in the third part of Appendix D. The answers generally were much better than a year ago. Especially in the matter of spelling a decided improvement was noticeable. On the whole, I feel free to say that the candidates who wrote at our last matriculation examination were in every way a very superior lot of young men; and hence

there were only a few who failed to pass. Their work and conduct since the examination have justified our first impressions. The total number in attendance during the term has been 126. The following list shows where they come from, and the religious denominations to which they belong. The names will be found in the second part of Appendix C.

Counties, &c.	*Students.*	*Counties, &c.*	*Students.*
Bruce	2	Ottawa City	10
Brant	3	Ontario	2
Carleton	1	Oxford	8
Durham	1	Prince Edward	1
England	2	Perth	6
Frontenac	4	Peel	2
Glengarry	1	Peterboro'	1
Grey	4	Quebec Province	5
Hamilton City	2	Renfrew	1
Halton	2	Simcoe	1
Huron	4	Scotland	2
Haldimand	1	Toronto City	6
Ireland	1	United States	1
Lanark	8	Victoria	2
Lincoln	1	Wales	1
London	1	Waterloo	3
Montreal City	8	Wellington	10
Middlesex	1	Wentworth	5
Norfolk	3	Welland	1
Northumberland	1	York	5
Nova Scotia	2		

Total number in attendance during Fall Term	126
Number of Ontario Counties represented	29

Religious Denominations.

Presbyterian	44
Episcopalian	43
Canada Methodist	21
Congregationalist	5
Canada Baptist	4
Roman Catholic	4
Primitive Methodist	2
Plymouth Brethren	2
Lutheran	1
Total	126

As questions are frequently asked about the age of our students, I may say that some sessions the ages have varied considerably from fifteen years upwards. In the fall term of 1880, the range was from fifteen to twenty-six—five at fifteen, twelve at sixteen, four at twenty-four, and two at twenty-six; leaving 103 between the ages of seventeen and twenty-three. The majority were eighteen or nineteen. The following table gives the exact number at the different ages:—

Ages of Students at the Ontario Agricultural College in the Fall Term of 1880.

5	at the age of		15	years.
12	"	"	16	"
12	"	"	17	"
28	"	"	18	"
29	"	"	19	"
12	"	"	20	"
8	"	"	21	"
9	"	"	22	"
5	"	"	23	"
4	"	"	24	"
2	"	"	26	"

Total 126; average age, 19 years.

The Fall Term being the first of a new scholastic year, the different members of the staff went to work with renewed vigour and a firm determination to do better than last year. I believe the ambition of every officer is to make the Ontario Agricultural College all that the people of Ontario could wish it to be—an institution second to none of the kind in either the old or the new world. The work in the different departments, was carried on without interruption, from the 2nd November to the 22nd December. Having lost a month at the beginning, it was necessary, in order to get over the prescribed work, to crowd as much as possible into the time that was left.

The first year students were introduced to the subject of Agriculture. The lectures embraced the reclamation of land, location of roads, lanes, and fences; examination and classification of soils; a description of the buildings and implements required on a well-equipped farm; rotation of crops, and other matters preparatory to the study of live stock which is to be taken up in the Winter Term. They had an extensive course of lectures, with experiments on Chemical Physics and Inorganic Chemistry, commenced the subject of Natural History, and spent some time in studying the anatomy and physiology of the horse and ox. Under the head of Mathematics and English, they read two cantos of "The Lady of the Lake," wrote impromptu compositions once a week, and reviewed portions of Arithmetic with special reference to the requirements of farming.

The attention of the second year men was directed to such subjects as Stock-breeding, Farm Management, and the Experimental Plots—the selection of animals for beef; the housing, feeding, and fattening of the same; the comparative values of pasture and green fodder; results from the different kinds of seed, soil, and manure; and the previous season's experiments with wheat, oats, and grasses. They had several lectures on Meteorology, and a full course on Agricultural Chemistry—the composition of different plants in relation to the soils on which they grow; the preservation and renovation of soils, the chemical composition and value of different manures, the superphosphates, double silicates, and other substances which furnish plant food. They spent two hours a week at lectures on Veterinary Pathology, and one a week in handling and examining horses for spavin, ring-bone, splint, founder, and other diseases—all under the eye and direction of our veterinary surgeon, Dr. Grange; they also read and committed to memory a great portion of the first two acts of Shakspeare's "Julius Cæsar"; and gave some time to the study of Applied Statics, Levelling, Surveying and Drainage. The following outline quoted from the syllabus on a previous page will convey a clearer idea of the term's work in the lecture-room:—

OUTLINE OF CLASS-ROOM WORK.

Fall Term.

First Year.

Department 1.—Agriculture.

Introductory.—Ancient and modern agriculture; agricultural literature; arts and sciences affecting agriculture; different kinds of farming.

Reclamation of Land.—Clearing, stumping, stoning, fallowing, etc.

Soils.—Origin and distribution of soil; natural conditions of soil and plant; examination and classification of soils; physical and chemical properties of each kind.

Rotation in Cropping.—Importance and necessity of rotation; principles underlying it; rotations suitable to different kinds of soil; examination and criticism of different systems of rotation.

Buildings.—Location of house, barn and stables; framing a building; model stables for horses, sheep and cattle; arrangement of farm buildings.

Implements and Machinery.—Principles in construction of implements and machinery; points to be aimed at; classification, examination and description of the same.

Miscellaneous.—Roads, lanes, fences, wells, etc.

Department 2.—Science.

Chemical Physics.—Matter, accessory and essential properties of matter; attraction, various kinds of attraction—cohesion, adhesion, capillary, electrical, and chemical; specific gravity; weights and measures; heat, measurement of heat, thermometers, pyrometers, specific and latent heat; sources, nature and laws of light; spectrum analysis.

Inorganic Chemistry.—Scope of subject; elementary and compound substances; chemical affinity; symbols; nomenclature; combining proportions by weight and by volume; atomic theory; atomicity of the most important elements; oxygen and hydrogen; water—its nature, functions, decomposition, and impurities; nitrogen; the atmosphere—its composition, uses and impurities; ammonia—its sources and uses; nitric acid and its connection with plants; carbon; combustion; carbonic acid and its relation to the animal and the vegetable kingdom; sulphur and its compounds; manufacture and uses of sulphuric acid; phosphorus; phosphoric acid and its importance in agriculture; chlorine—its bleaching properties; bromine; iodine; silicon, etc.

Zoology.—Nature of life; vital force; difference between animals and plants phology and physiology; homology and analogy; definition of species; classification; subdivisions of the animal kingdom; characters of the classes and most important orders of *Invertebrates*; general characters of *Vertebrates*; classes and orders, with a brief description of each.

Department 3.—Veterinary Science.

Anatomy and Physiology of the horse, ox, sheep and pig; osseous system, muscular system, syndesmology, plantar system, and odontology.

Department 4.—English.

Lectures on Composition.—The sentence, the paragraph, and the period; capitals and punctuation; style—its qualities and varieties. *Exercises in Composition.*

English Classics.—Committing to memory, and critical study of Scott's "Lady of the Lake."

Department 5.—Mathematics.

Arithmetic.—Review of subject, with special reference to farm accounts; tables of weights and measures discussed; compound proportion, interest, discount, stocks and partnership.

Mental Arithmetic.—Calculations in simple rules, fractions and compound rules.

Second Year.

Department 1.—Agriculture.

Experimental Plots.—The results of last season's experiments with wheat, oats, barley, pease, grasses, clovers, roots, etc.; liability to disease; effects of various manures on different crops; growth of plants, etc.

Farm Management.—Detailed account of the treatment of each field, results from different kinds of seed and soil; effects of manure; harvesting, storing, and threshing of crops; fall ploughing; subsoiling, &c.

Stock-feeding.—Value of feeding materials; estimate for winter keep of live stock; housing, feeding, and fattening; points to be observed in selecting animals for fattening; feeding experiments; common diseases of animals; management of animals on pasture; value of green fodder. Dairy management and cheese-making.

Department 2.—Science.

Meteorology.—Relation of Meteorology to Agriculture; composition and movements of the atmosphere; nature and manipulation of the barometer, its importance in forecasting the weather; temperature, description of the various instruments used in its measurement and how to use them; solar and terrestrial radiation; the influence of forests on climate; mists, fogs, clouds, rain, hail, and snow; description of instruments used in measuring rain and snow fall; velocity and direction of wind; causes affecting climate; influence of climate on vegetation.

Agricultural Chemistry.—Connection between chemistry and agriculture; the various compounds which enter into the composition of the bodies of animals; the chemical changes which food undergoes during digestion; chemical changes which occur during the decomposition of the bodies of animals at death; the functions of animals and plants contrasted; food of plants and whence derived; origin and nature of soils; classification of soils; causes of unproductiveness in soil and how detected; composition of different plants in relation to the soils upon which they grow; rotation of crops; preservation, development and renovation of soils; manures classified; the chemical action of manures on different soils; chemical theories in reference to the action of superphosphates; the action of lime in the decomposition of double silicates; feeding of animals; classification of foods; chemical results in the use of different foods; points necessary to be considered in order to obtain the full value of artificial and natural foods.

Department 3.—Veterinary Science.

Veterinary Pathology.—Osseous System—nature, causes, symptoms, and treatment of diseases of bone, as splint, spavin, ringbone, etc.

Muscular System—nature, causes, and treatment of flesh wounds, etc.

Syndesmology—nature, causes, symptoms, and treatment of bog spavin, curb, and other diseases of the joints.

Plantar System—nature, causes, symptoms, and treatment of corns, sand-crack, founder, and other diseases of the foot.

Odontology—diseases of the teeth and treatment of the same.

Department 4.—English.

Lectures.—Etymological, syntactical, and rhetorical forms of the English language;

history of its formation; its connection with other languages; rhetorical figures; their use and abuse; prose and poetic diction.

Composition.—Essay writing, familiar and business correspondence.

English Classics.—Critical study of Shakespeare's "Julius Cæsar."

Department 5.—Mathematics.

Mental Arithmetic.—Calculations in reduction, fractions and analysis.

Mensuration.—The mensuration of surfaces, including lumber, etc.; the measurement of solids, including contents of tanks, ditches, wells, etc.

Land Surveying.—With chain and cross-staff.

II.—The Boarding House and College Buildings.

The college building, as shown on frontispiece, is a plain substantial structure without much claim to architectural beauty. Like the institution itself, it was built little by little without any very definite idea of the shape it might ultimately assume. When the Government first bought land and determined to establish an agricultural college, the architect drew plans for a building which would have suited the purpose exactly, but the cost seemed too great and the country was not prepared for it, consequently it was decided six years ago to commence work with a few students in Mr. Stone's farm-house. Additions and alterations were made from time to time as the number of students increased, till the result is, the building which you see outlined and described on page 36—something different from what was ever intended; and though it is not what we would like, it nevertheless affords considerable accommodation, and serves the purpose very well.

In my last report I recommended among other things, that increased accomodation be provided, and that the college be heated by steam, and lighted by gasolene. I am now happy to say that under each of these heads the Legislature did even more than I ventured to ask. The building is very different from what it was a year ago. The extensive additions and alterations made during the last eight months, have not only increased the accommodation, but changed the whole aspect of the place. The raising of the centre portion has removed the flat appearance which formerly characterized the building, while the erection of the new building in the rear of the left wing, and the filling up of the space between the centre, and the class-room in the right wing, has furnished thirty-four new dormitories, a large dining-hall, a reading room, a library, a sitting-room and a bed-room for the Assistant Resident Master, a wash-room, and two class-rooms.

In the building, as it now stands, there are one hundred and twenty-two rooms—three class rooms, a reading room, a library, a room to be fitted up for a museum, a laboratory, two offices, a public reception-room, sixty-two students' dormitories, a large dining-hall, a servants' dining-room, a store-room, pantry, kitchen, scullery, laundry, drying-room, eight bath-rooms, nine bed-rooms for servants, the messenger's room, a parlor and bed-room for the Matron, a sitting-room and bed-room for the Assistant Resident Master, nine rooms in the left wing occupied as a dwelling house by the Professor of Agriculture, six rooms in the centre occupied by the President and his family, three wash-rooms, an engine-room and a coal house. The size, position, and use of each room can be better understood from an examination of the plans above referred to than from a verbal description. Hence I shall not attempt anything more elaborate under this head.

Provision has been made for heating the building with steam; and every room in it is now lighted, not by gasolene, but by ordinary coal-gas from the city of Guelph. The gas company laid the pipes out to the college and the contractor extended them through the building. So that now we not only have good light, but are free from the danger connected with the use of coal oil in so large an institution.

In the boarding house, things have gone on much as of old ; but for some months past, the duties in connection with it have been much more arduous than at any time previous. The large additions to the building, and the corresponding increase in the number of students, have added not a little to the work of the President, the Assistant Resident Master, and the Matron, while the presence of masons, carpenters, plasterers, painters, gas-fitters, and steam-fitters pacing to and fro, and plying their tools from June to January, in every hall and room from cellar to garret, has given rise to an unusual amount of worry, anxiety and confusion. In the face of such difficulties as these, the Matron discharged faithfully the many duties connected with her department ; the Assistant Resident Master took charge of the students in the dining room, and assisted me in looking after them in the halls, dormitories and class-rooms ; the Bursar provided the supplies ; and altogether the work went on satisfactorily. The conduct of the students was good ; no serious cases of discipline occurred since my last report. Some, of course, did not work so well as they should, and others were inclined to give trouble now and then ; but the great majority were quiet, thoughtful and industrious. The few idle and troublesome ones were kept in their place by the exercise of vigilance, firmness and kindness ; and the result, on the whole, was earnest work and good order in every hall. For a better understanding of the surroundings of our students in the boarding house, and the duties required of them, I may say that their bed-rooms are furnished with beds, bedding, bureaus, mirrors, wash-stands, study-tables, and chairs. They sleep separately, two in a room, and in a few instances three. The daily routine during the fall, winter and spring terms, is as follows :—

They rise at a quarter to six, make their beds and put their rooms in order. At fifteen minutes after six they go to morning prayers, and at half-past six to breakfast. At seven the students of one division are sent to work outside, and those of the other employ their time as they feel disposed, till eight o'clock. From eight to nine the latter are at drill or gymnastics, and from nine to twelve at lectures in the class-room. Both divisions then return to the boarding house, and prepare for dinner at half-past twelve. The bell rings at half-past one, and the division that was in at lectures in the forenoon, goes out to work in the afternoon. The other division is free till two o'clock. From two to five it attends lectures ; and at five both divisions return again to the boarding-house to prepare for tea, at half-past five. From tea time to seven o'clock, and in spring to eight o'clock, they generally rest or take exercise. From seven to nine in fall and winter, and from eight to half-past nine in spring, they study in their rooms, or under a master in one of the class-rooms. At nine or half-past nine, according to the season of the year, they proceed to roll-call and evening prayers ; all lights are put out at ten, and doors closed at half-past ten. Every student who is not under ban for some misdemeanour, is allowed out one evening in the week, till half-past ten. To some parents perhaps this will appear late ; but, as it takes not less than thirty minutes to come from the city to the college, any earlier hour would scarcely give sufficient time. When going out, each leaves his name with the master in charge, and is required to report himself on his return, that we may know whether all are in or not before the doors are closed for the night.

Such is the routine in the boarding house, and such are the duties required of the students therein, during nine months of the year. As the months of July and August are devoted entirely to work in the outside departments, the duties inside differ but little from those of an ordinary boarding house on a large scale.

I served an apprenticeship of twenty-one years at farming in this country—I learned practically how to chop and clear, dig and plough, sow and reap, and all the rest ; I afterwards taught and governed young men and women for eleven years ; but never till last year did I attempt to manage a large boarding house and a college together. It is entirely a new phase in my experience, and I scarcely know how to describe it. I would like to say that it is the most thankless and annoying business in which a man ever engaged—a business which takes one away from his family day and night, which destroys the associations of home, which worries a person till he is apt to become peevish and absent-minded—in a word, a business which no man should undertake, unless he is prepared to abandon all hope of comfort and happiness while he is engaged in it. This is

what I would like to say. What I do say, is that the duties involved in the management of a large boarding house are onerous and trying under any circumstances, but especially so when there is added thereto the work of lecturing from two to three hours a day, superintending the studies and conduct of one hundred and thirty young men from six in the morning till half-past ten at night, waiting on a large number of visitors, and attending to the correspondence and general business of a college. Put all these together, add the item of no holidays, and you have a concentration of labour and anxiety sufficient to test the mettle of any man—at least, you have evidence sufficient to prove that the presidency of the Ontario Agricultural College is not a sinecure.

III.—The Business Department.

The first thing to be noticed under this head relates chiefly to the President of the College, that is,

The Correspondence.

The Ontario Agricultural College is not yet understood so well as it should be either in the Province or outside of it. There is ample evidence that it is fast growing in favour at home and becoming pretty well known abroad ; but there is still an endless number of inquiries about the terms of admission, course of study, duties of students, cost, books used, books recommended—and many other questions which require to be carefully answered. Add to this the correspondence growing out of the ordinary business of the institution, and you have work enough to keep one a couple of hours a day throughout the whole year. Some letters are simply answered and no further note taken of them ; others, being more or less important, are copied, and the names, post-office address, and business recorded in a book kept for the purpose. Of the latter kind, I wrote about 1,700 last year. Over 2,100 circulars and 1,800 copies of our annual report were sent out. Eleven hundred reports were distributed among the Subordinate and Division Granges, and the balance sent chiefly to those who applied for them.

Books and Accounts.

Most of the work in this branch of the business department is done by the Bursar. Every month he receives the accounts against he College and the Farm, examines them, checks them by invoices and requisitions, arranges them in due form, makes out separate statements for the College and the Farm, submits the former to the President and the latter to the Farm Superintendent for approval, and then sends both to the Treasury Department for payment. He receives and accounts for all moneys from the Treasury Department, the students, and the farm ; and pays all accounts that have been approved by the President or the Farm Superintendent, and passed by the Auditor in Toronto. In addition to a cash book and memorandum books of various kinds, he keeps three distinct sets of books—

No. 1, showing the monthly expenditure under each head of the appropriation for salaries, wages, and college expenses.

No. 2, giving in detail the income and expenditure of the outside departments under three heads—the farm and carpenter-shop, the garden, and the experimental department.

No. 3, which shows the account of every student from the day he enters the College till he leaves it—fees, board and washing, amounts allowed for labour in the outside departments, and cash balances paid to the College for board and washing.

The second set involves considerable work, and the third a great deal. "Printed sheets containing the names of all the students are furnished each foreman daily, who fills in the blanks with the description of work done that day by the students

in his department, the number of hours each has worked, and the estimated value of such work. These are filed daily in the office, and journalized weekly. At the end of the financial month these sums are posted to the credit side of each student's account in the ledger, whilst on the debit side is placed the exact cost of the board and washing for that month, obtained from the books of the store-room and the laundry. At the end of the session those sheets are bound together and make the day-book for that session." From this it will be seen that one hundred and seventy-six such accounts had to be kept during the past year, involving an amount of work of which the uninitiated have no conception.

General Business.

Owing to the large additions to the building, and the increase in the number of students, there was an unusual amount of general business to do in connection with the College during the year 1880. The President had not only to lecture, wait on visitors, and attend to the ordinary business of the institution, but to select and purchase a large amount of furniture for the kitchen, dining-room, beds and bed-rooms, reading-room, library, and class-rooms. The Bursar looked after the supplies for the boarding-house, and with the aid of the Matron took full charge of the college store-room—examined, checked and weighed meat, groceries and other articles as they were delivered, in order to see that all contracts were faithfully carried out. The Farm Superintendent and his foremen made all purchases for the maintenance of the outside departments—the farm, garden, carpenter shop, and experimental department. With these the Bursar had nothing to do, except arrange the accounts as they were handed in, and forward them to Toronto for payment.

The Finances.

In making out statements under this head, as everywhere else, I have endeavoured not to interfere with anything which properly comes under the report of my friend and colleague, Mr. Brown. Hence my financial tables, which will be found in Appendix F, refer to the College and boarding-house alone. The first table shows the appropriation expenditure in 1880, the second is a statement of the revenue for the same time, the third gives an estimate of the expenditure in 1881, and the fourth is a copy of the college account with the farm, garden and carpenter shop for the past year.

The sum of $2,000 was voted on capital account for furniture and furnishing. The expenditure under that head will be found at the end of Table 1. The amount allowed for maintenance was $22,850. This is no more than was actually needed. The whole amount might have been profitably laid out under the heads for which it was voted; but as we intended to ask a large sum for the erection of a new laboratory this year, we felt bound to cut down expenses at every point. Hence, by special care and economy on the part of the Matron, the Bursar and myself, we succeeded in keeping the expenditure down to $21,822.15, which leaves a balance of $1,027.85 to the credit of the Province. It may be stated thus:—

Amount voted for 1880	$22,850 00
Amount expended in 1880	21,822 15
Balance to credit of Province	$1,027 85

Table 2 is a very brief statement of the revenue for the year—$2,407.02 paid by students for board and washing, and $1,625 tuition fees, making a total of $4,026.02. This subtracted from the expenditure, shows the net cost of the institution for the last twelve months:—

Expenditure in 1880	$21,822 15
Revenue in 1880	4,026 02
Net outlay in 1880	$17,896 13

Most agricultural institutions have found difficulty in combining the practical work of apprenticeship with the theoretical instruction of the lecture-room. To avoid this difficulty as far as possible, the Ontario Agricultural College adopted the plan of paying all students for their work. The intention was to vary the rate of wages according to the character and amount of the work done; but the fact is, we are forced by the circumstances of the case, not unfrequently, to pay for work that is really worth nothing. Notwithstanding this difficulty, however, the marked success of the College in securing attention to practical as well as theoretical work, proves conclusively the wisdom of the plan adopted. If the students were allowed little or nothing for their work, we could present a better balance sheet; but the College would be much less efficient, and, as often happens, the gain in money would be more than counterbalanced by a loss in another direction. By turning to the last item in Table 4, Appendix F, you will see that the allowance to students for labour last year amounted to $4,347.23. If this were deducted from the net outlay for the year the expenditure would be a comparatively small sum to run a college with:—

Net outlay for 1880.	$17,896 13
Amount of the above sum allowed students for labour...	4,347 23
Balance.....	$13,548 90

In the right hand column of Table 3, you will find the estimated expenditure for 1881. The increase under this head will, doubtless, give rise to some inquiries; so a word of explanation may be necessary. First of all, I have asked for small additions to the salaries of two or three officers who, in my opinion, should have more than they got last year; but the increase is nearly all due to three things:—

(1) The increase in the number of students, which is over one-third greater than it ever was before.
(2) The change from coal-oil to coal-gas for lighting the College.
(3) The heating of two additional buildings, which adds quite an amount to the outlay for fuel.

Apart from the last two items, the increase is not in proportion to the increase in numbers. The amount voted last year for furniture and furnishing was not nearly sufficient; hence I am forced to ask for $2,000 more. I have several times spoken and written about a new laboratory for the Institution; but I have not yet presumed to ask any definite sum for that purpose. I leave it to yourself and the architect to name the amount required.

IV.—Conclusion.

Instruction in Agriculture.

Success in agriculture ensures success in every other occupation; failure in agriculture means failure everywhere else. No argument is necessary to prove that it is the foundation on which the prosperity of this country has been built. If it gives way, the whole fabric is sure to fall. Hence the necessity of using the accumulated wisdom of the ages to secure the best results in this pursuit. If specific, technical instruction is a needful preparation for law, medicine, dentistry, or pharmacy, why not for farming? If a young man intends entering the legal profession, he spends from three to five years in the study and practice of law; if he desires to become a physician, he attends lectures on medicine and enters a doctor's office to learn the first principles of the practice; or if he aims at being a druggist, he studies the pharmacopœia and serves an apprenticeship in a drug store. But in farming, the most important of all, it is expected that a young man should go to work and make a fortune without any special training whatever. I am glad to say, however, that this idea is being exploded; our people are beginning to realize

that special preparation is needed no less for the pursuit of agriculture than for any other industry. The existence of the Ontario Agricultural College is a proof of this.

The College.

As President of the College, I cannot discuss the question of its efficiency or inefficiency so freely as I would under other circumstances. No doubt to our faults we are "a little blind," if not to our "virtues very kind"—we do not see ourselves as others see us; but admitting all past errors and present defects, I think it is not too much to say that the Ontario Agricultural College is an institution of which the Province may be proud, and one that should be supported, not only by the farming community, but by every other class that seeks the prosperity of the country. It is the only school in the Province which gives instruction in agriculture, agricultural chemistry, horticulture, and stock-raising; it is the only place where questions relating to such subjects are systematically studied and discussed. The course of study is confined to those branches which have a somewhat direct bearing on the duties of the agriculturist, horticulturist, and stock-raiser; its success in combining practical work with theoretical instruction has not been surpassed anywhere; and the whole tendency of the training given is not only to make more intelligent farmers, but to educate them to the belief that there is no more honourable occupation than that of the agriculturist; that socially, politically, and even financially, there are few to compare with it; and that in the matter of independence, contentment, and real happiness, there is scarcely one equal to it. The position of the College in the centre of a large stock-raising district, containing a number of the best Shorthorn, Hereford, Devon, and Galloway herds in the Dominion, is a matter of some importance. The students visit these herds from time to time, and attend the famous fat-cattle shows in Guelph at Christmas and Easter. Last year each was required to examine the different animals exhibited, and afterwards draw up and read a special report on them, and on the show as a whole. In the time of my predecessor the foundation of the institution was laid broad and deep; we are now doing our best to strengthen that foundation and to build upon it. During the past year some progress has been made; a large three-storey building has been erected, and the old one very much enlarged and improved; provision has been made for heating the whole premises with steam, and lighting every room with gas; a sidewalk has been laid from the College to the city; and the number of students has increased from 92 to 130.

Reading-Room and Library.

An excellent reading-room has also been provided, and a very nice and commodious room for a library; and all we now require to make this department complete is a full supply of books, magazines, and papers. We already have 475 volumes in the library, consisting of reports, herd-books, books of reference in all the subjects taught, and a fair supply of general reading. We also have on file in the reading- room the following papers and magazines, furnished by the College and the Literary Society:

Furnished by the College.

Daily Globe.
Daily Mail.
Weekly Globe.
Weekly Mail.
Guelph Mercury.
Guelph Herald.
Canadian Farmer and Grange Record.
Farmers' Advocate.
Canadian Horticulturist.
North British Agriculturist.
Irish Farmer's Gazette.
Mark Lane Express.
National Live Stock Journal.
Boston Journal of Chemistry.
Scientific American.
Scientific Amer. Supplement.
Cultivator and Country Gentleman.
American Agriculturist.
Aberdeen Free Press.
Grip.
Bystander.
Canadian Monthly and National Review.
Leisure Hour.
Sunday at Home.
Good Words.
Quiver.
Sunday Magazine.

Provided by the Literary Society.

Canadian Illustrated News.
Punch.
Rural New Yorker.
Frank Leslie's Illustrated Paper.
The Graphic.

When visiting the Michigan Agricultural College, over a year ago, I was pleased to find that nearly every editor of any note in the State sent a copy of his paper free to the reading-room of that institution. I might here say that similar donations from the editors of Ontario and other parts of the Dominion would be appreciated by the students of the Ontario Agricultural College. The public spirit and princely munificence of our neighbours across the line, as manifested in the erection and endowment of schools and colleges in their country, are known all over the world. The people of Canada have as yet done very little in this direction; they do not seem to think that it is either a privilege, an honour, or a benefit, to contribute money for such objects. I am pleased to say, however, that there are occasional exceptions; there is now and then one whose liberality deserves special mention. A couple of months ago a very nice outfit for a gymnasium, worth about $200, was purchased for the Ontario Agricultural College by our old and tried friend, Captain McCrae, of Guelph. A portion of that outfit has been placed in a vacant class-room, and is already in use. The young men appreciate it very much; and I hereby take the liberty of thanking the Captain on their behalf for so handsome a gift; and in this connection, I may add, that since the appointment of Sergeant-Major Clarke as instructor in drill and gymnastics, the exercises under these heads have been a source of unusual pleasure and profit to the students as a whole.

Literary Society.

The young men have formed themselves into a Literary Society, with a regular constitution and by-laws. This Society meets every Friday evening at half-past seven, in one of the class-rooms, to practise declamation, read essays, and debate questions relating to agriculture, stock-raising, and other matters of interest to the yeomen of this country. These discussions are often quite spirited; and there is no doubt that the work done in such societies is a valuable addition to the educational appliances of an institution. In the performance of such work the young men have an opportunity of measuring their strength and testing their armour before they set out in the warfare of life; they gradually learn to speak in public; their wits are sharpened, their reasoning powers developed, and their manners improved. The regular meetings of the Society are open to the members only; but once a year they give a literary and musical entertainment to their friends in Guelph. The only difficulty in connection with these entertainments and other public gatherings on stated occasions is, that we have no room half large enough to accommodate those who come; and this brings me to the question of wants and

Recommendations.

In connection with my estimates for next year, I took the liberty of calling your attention to what appears to me to be the most pressing wants of the institution at the present time, I shall now venture to repeat some of the requests then made.

Salaries.—Most people are working for a living, and some few for a reputation. Hence it is not to be expected in the civil service, more than anywhere else, that a man will long continue to do the best that he is capable of doing, unless he receives suitable remuneration for his services. He may put in his time and do fairly well; but he will not work late and early, and exert every energy to secure success, so long as he feels that no one will thank him for his extra trouble, and that he cannot make a cent a year more than by the perfunctory discharge of the time-honoured routine. Poor pay generally means poor service, and very properly so. Therefore it seems evident that the wise and economical policy for either a Government, or a private individual, is to pay good salaries and insist on good work. From Table 3, Appendix F, it will be seen that I have recommended a small increase in the salaries of three or four of our staff; and,

without prejudicing the case of any, I beg leave to press the claims of one or two. When my assistant, Mr. Mactavish, was appointed, his duties were not nearly so onerous as they are at the present time. We then had a much smaller building and about forty students less to look after than we have now. His hours of duty in the boarding house are long (5.45 in the morning to 10.30 at night), his responsibility is heavy, and he lectures about three hours a day on Arithmetic, Mensuration, Mechanics, Levelling, Surveying, Book-keeping. I therefore recommend that his salary be raised from $500 to $600 a year. Our Professor of Chemistry, J. Hoyes Panton, M.A., does an amount of work in the College which seems to say that his services are worth as much to the country as those of the Science Masters in the other Government institutions, such as the Normal Schools and the School of Practical Science. Our institution is no less important; Mr. Panton is no less scholarly; his work and responsibility are no lighter. He takes charge of the library, superintends all practical work in the laboratory, and lectures from four to five hours a day on Inorganic Chemistry, Organic and Practical Chemistry, Geology and Physical Geography, Systematic and Economic Botany, Meteorology and Entomology; yet the estimates of last year show that his salary is from $300 to $600 a year less than what is paid in the other institutions. In view of these facts I think I am justified in recommending that Mr. Panton's salary be raised to $1,500, which is the lowest sum paid any other Science Professor in the service of the Province.

The Horticultural Department.—I think the time has come when steps should be taken to reorganize the Horticultural Department of the institution. A short trip through almost any portion of the Province will convince one that an effort should be made to impress upon the minds of our young people the importance of making the surroundings of home as tidy, tasty, and cheerful as possible. In most country districts there is a great lack in this respect; and therefore I think the College should give the matter considerable prominence. Our present hot-houses are behind the times; they are not only too small, but the heating apparatus is so defective that most of the plants are stunted in growth, and a few of the best destroyed every winter with smoke. A portion of the farm has lately been allotted to the Fruit Growers' Association for the purpose of experimenting with various fruit and forest trees; and some person is needed to take charge of it, and to publish the results from year to year. Therefore, I beg leave to recommend that new hot and propagating houses be built, and that a Professor of Botany and Horticulture be appointed to take charge of the experimental plots, orchards, lawns, and gardens; to lecture on Botany, Horticulture, Fruit-culture, Floriculture, and Forestry; and to prepare and publish annual reports on the work done.

A Laboratory.—I shall not trouble you by repeating what I have already said regarding books for the library, the fitting up of the museum, or the building of a convocation hall and two or three cottages; but content myself with referring briefly to our need of a laboratory. And I have so often spoken of this matter that it seems useless to say anything more. It is undoubtedly the most pressing want of the institution at the present time. When we had from fifty to ninety students we could make some progress in a laboratory eight feet wide by fourteen feet long, but with 130, it is little less than a farce to attempt any practical work in the department of chemistry. Hence, I think no one will deny that we very much need a large laboratory, equipped with the best apparatus that money can purchase—a place where at least eighty young men could work under the direction of our chemist, and where, at small cost, samples of soil, manure, and fodder could be analyzed, and the results published for the information of the farming community. Therefore, I not only recommend, but urge that the sum of $12,000 be placed in the estimates for the erection of a laboratory which shall meet the requirements of the College and the country.

I have the honour to be,

Sir,

Your obedient Servant,

JAMES MILLS,

President.

AGRICULTURAL COLLEGE, AND EXPERIMENTAL FARM, GUELPH, ONTARIO.

DESCRIPTION OF THE BUILDINGS, ETC., PREPARED BY THE ARCHITECT OF THE PUBLIC WORKS DEPARTMENT.

The Farm, containing 550 acres, was purchased from Mr. F. W. Stone, Guelph, in 1873, for the sum of $75,000, and is situated on the Dundas road, about one mile from the City of Guelph.

The buildings have been erected on an elevated portion of the Farm, on the north side of the Dundas road, commanding an extensive view of the surrounding country, and the City of Guelph. The principal entrance is from the Dundas road, at the south-west angle of the grounds in front of the buildings, which have been skilfully planted; the hot-houses and horticultural gardens being in the south-east part of the premises, and having a separate entrance on the Dundas road.

The original building, to which additions have been made according to the requirements of the College, as the number of pupils increased, consisted of a stone dwelling house, 53 feet by 39 feet, with addition in the rear for kitchen, laundry, etc., 60 feet by 24 feet, the whole being two storeys in height.

Commodious farm buildings of stone and wood, with enclosed yards, also stone, brick, and wood farm houses, were also on the premises when purchased, and the lots were surrounded by good post and rail fences. The greater portions of the lots were cleared and well cultivated, the remaining portions being wooded and retained for ordinary farm requirements.

The following additions were made from time to time to the original dwelling house:—Dining, reading, and class rooms, also a lavatory, laundry, steam heating apparatus, and apartments for the domestics were constructed in 1873-4, the College having been opened in the latter year. Apartments for twenty-eight pupils were fitted up in the stone farm house, in the front portion of the grounds. This building was burnt down in February last year, and the walls were so much injured that it has not been re-constructed.

In 1875 a mansard roof was constructed over the front portion, and at a distance of 50 feet on the south-east side, the College authorities erected a building 40 feet by 50 feet, two storeys in height, with mansard roof, for lecture and class rooms.

An addition, 94 feet in length by 50 feet in width, two storeys in height, with mansard roof, was made on the north-west side in 1877, affording accommodation for thirty additional pupils, with a new dining-room, also apartments for the Professor of Agriculture. A cheese factory was also erected south of the Dundas road. Further additions were made in 1879 and 1880, consisting of store rooms, Matron's and domestic apartments, also a larger dining room, 62 feet by 40 feet, and dormitories for sixty additional pupils, making, in all, apartments for 130 pupils, with larger reading room and library, baths and wash rooms, all being heated by steam, on the direct low pressure principle, by means of coils and radiators, a new boiler house, 38 feet by 24 feet, containing two large steam boilers, with coal house attached, having been constructed for the purpose.

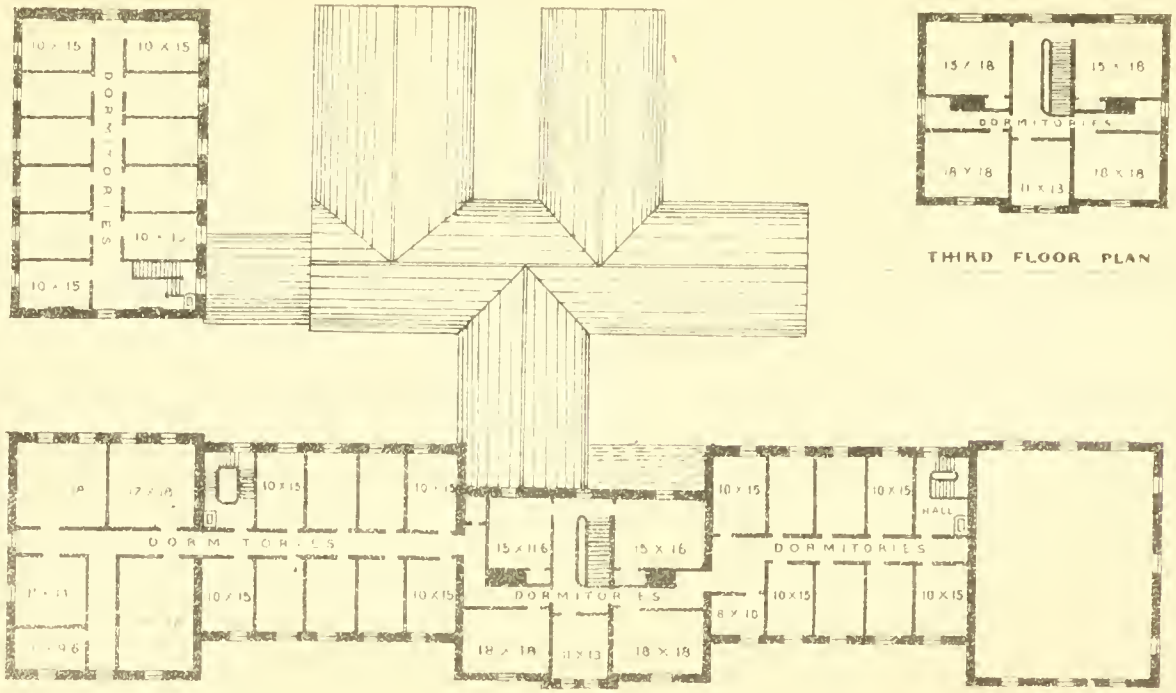
The water supply at present is from wells and tanks on the premises; and the water is pumped into a large tank in the centre tower, from whence it is distributed to the several baths, wash-rooms, and sinks, the baths and sinks being also supplied with hot water. Arrangements will probably be made with the city water works of Guelph to extend their mains to the buildings during 1881, when water will not only be supplied for the requirements of the College, thereby saving the cost of pumping, according to present arrangements, but the buildings will be protected from fire by means of hydrants in the grounds.

The City Gas Company of Guelph, extended their mains to the buildings during 1880, and all the apartments are now supplied with gas light. The buildings now completed

AGRICULTURAL COLLEGE,

GUELPH, ONT.

SCALE 40 FEET TO AN INCH



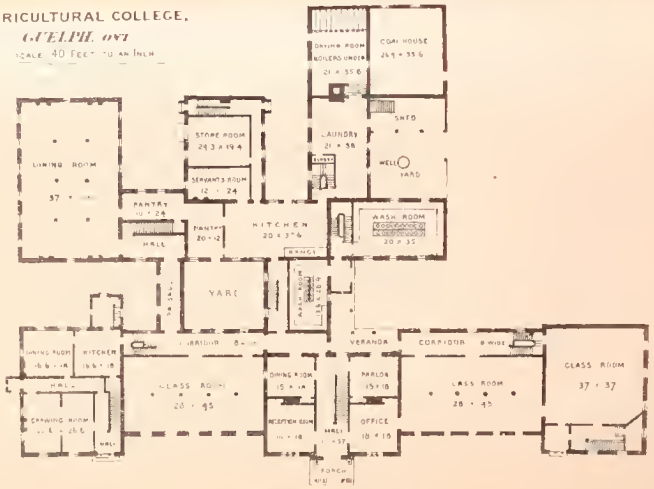
THIRD FLOOR PLAN

SECOND FLOOR PLAN.

AGRICULTURAL COLLEGE,

GUELPH, ONT

SCALE 40 FEET TO AN INCH



GROUND FLOOR PLAN

AGRICULTURAL COLLEGE.

GUELPH, ONT

SCALE 40 FEET TO AN INCH

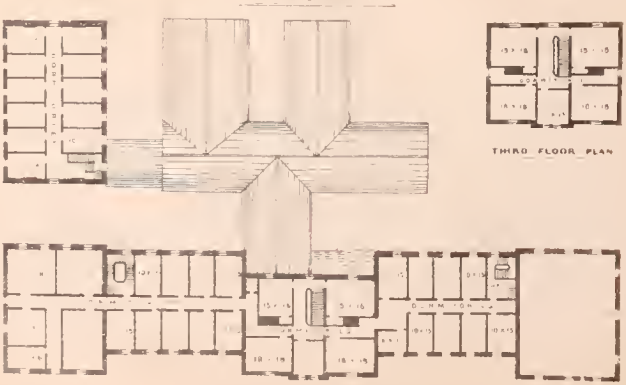
FIRST FLOOR PLAN

AGRICULTURAL COLLEGE

GUELPH, ONT

SCALE 40 FEET TO AN INCH

THIRD FLOOR PLAN



SECOND FLOOR PLAN

occupy a space of 240 feet in front by 180 feet in depth, and contain a reception-room and office, four large class and lecture-rooms, with dining and reading-rooms, library, dormitories for 130 pupils, bath-rooms and lavatories, and apartments for the President, Professor of Agriculture, Assistant Master, and Bursar, also Matron's and servants' rooms.

The perspective view shown on frontispiece and the accompanying plans which have been prepared in the Department, will explain the arrangement, dimensions, and relative position of the various apartments, also the external appearance of the building, which now presents more of a public character than might have been expected, considering the basis on which the various superstructures were erected.

Further improvements will have to be made in 1881, to complete the furnishing and other internal arrangements, and render the buildings suitable in all respects for the requirements of the College.

The total cost of land and buildings, furniture, live stock, implements, drainage, etc., to the end of 1880, amounts to $198,029.51.

APPENDIX A.

CIRCULAR OF THE ONTARIO AGRICULTURAL COLLEGE FOR 1880.

Staff.

James Mills, M.A., *President, Professor of English Literature and Natural History.*

William Brown (*Gold medallist of the Scottish Arboricultural Society and of the Highland and Agricultural Society of Scotland*), *Professor of Agriculture and Farm Superintendent.*

J. Hoyes Panton, M.A., *Professor of Chemistry.*

E. A. A. Grange, V.S., *Professor of Veterinary Science.*

Alexander McTavish (*First-Class Prov. Certificate*), *Assistant Resident and Mathematical Master.*

P. J. Woods, *Instructor in Farm Department.*

James Forsyth, *Instructor in Horticultural Department.*

James McIntosh, *Instructor in Mechanical Department.*

Thomas Johnston, *Bursar.*

Introduction.

The institution known as the "Ontario Agricultural College and Experimental Farm," is situated about a mile to the south of the City of Guelph, in the centre of an extensive agricultural and noted stock-raising district, readily accessible by rail from all parts of the Province. The Farm consists of 550 acres, about 400 which are cleared. It is composed of almost every variety of soil, and is therefore well suited to the purposes for which it was selected.

Immediately upon taking possession, the Government appointed a Commission to inquire and report regarding "the manner of adapting the said farm and management and control thereof to the purpose of a Model and Experimental Farm." A few extracts from the Report of this Provincial Farm Commission will show clearly the basis upon which the institution is at present established.

"The objects of the institution should be—First, to give a thorough mastery of the practice and theory of husbandry to young men of the Province engaged in Agricultural or Horticultural pursuits, or intending to engage in such; and, second, to conduct experiments tending to the solution of questions of material interest to the Agriculturists of the Province, and publish the results from time to time.

"That the Farm should be separated into five distinct departments, namely:—

"1. Field Department.
"2. Horticultural Department.
"3. Live Stock Department.
"4. Poultry, Bird and Bee Department.
"5. Mechanical Department.

"All permanent improvements on the Farm should be carried out on a gradually developed system, and in such a manner as to exhibit and test the comparative values of the most approved methods of executing the several works; and to test the cost, convenience and durability of the several appliances from time to time recommended for adoption on the farms of the Province."

In order to carry out the suggestions of the Provincial Farm Commission, the Government made such improvements on the residence found on the place as would best utilize it for present purposes. Accommodation was provided for about twenty-five pupils, a Principal and a Rector were appointed, and a Foreman for each of the following departments engaged, viz.:

1. Farm Department.
2. Live Stock Department.
3. Horticultural Department.
4. Mechanical Department.

Work commenced in May, 1874. Since that time considerable progress has been made. There are now ninety-two students in attendance—all boarding in the institution; and it is hoped that our Parliament, at its next session, will make an appropriation, to increase the accommodation at once. Many improvements have been made on the Farm. A considerable portion of it has been well drained, suitable implements have been provided, and a very fair representation of stock secured—seven breeds of cattle, five of sheep, and three of pigs. The Horticultural Department has been thoroughly established, and is now one of the most efficient means of education in connection with the institution.

TERMS OF ADMISSION.

1. Each candidate must be at least fifteen years of age.
2. He must produce satisfactory certificates—

   (1) As to moral character.
   (2) As to physical health and strength.
   (3) As to the assent of his parents or guardian.
   (4) As to his intention to follow Agriculture or Horticulture as an occupation.

3. He must pass the Matriculation Examination.
4. If a ratepayer or a *bonâ fide* resident of the Province of Ontario, he must pay a fee of $25 a year in advance; if not, he must pay a fee of $50 a year in advance.

The subjects for matriculation are as follows:

(*a*) Reading, writing and dictation.
(*b*) English Grammar—parsing and analysis.
(*c*) Arithmetic—to the end of Simple Proportion.
(*d*) The outlines of General Geography, and the Geography of Canada.

Candidates for admission are required to present themselves for examination on the 16th of April or the 1st of October, at 9 a.m., in the Lecture Room of the College.

First, Second and Third Class Teachers, holders of Intermediate Certificates or Certificates of Entrance to High Schools, Graduates or Undergraduates of any University in Her Majesty's dominions, will be admitted on presentation of certificates or diplomas. Intending students who do not hold any such certificate or diploma are advised to pass the examination for admission to High Schools, to save the expense and annoyance of having to return home in case of their failing to pass our Matriculation Examination.

Heretofore there has been a Preparatory Class in connection with the College for young men who understood the ordinary routine of farming, but could not pass the Matriculation Examination. In future, such candidates will be admitted if the number of qualified applicants be not sufficient to fill all vacancies.

Farmers' sons, or others following the occupation of farming, will be allowed to attend the Classes during the winter session, which shall count as a year, under conditions hereinafter specified.

COURSE OF INSTRUCTION.

The instruction given at the institution is embraced under two heads: a Course of Study and a course of Apprenticeship.

1.—COURSE OF STUDY.

The regular course of study for matriculated students is one of two years. There is a special course for those attending during the winter session only, whereby, no apprenticeship being undertaken in that time, additional studies are possible, and the whole two years' course is completed in two winter sessions.

First Year.

SUBJECTS:

Practical Agriculture.
Veterinary Anatomy.
Veterinary Materia Medica.
Physical Geography.
English.
Chemistry.
Botany.
Zoology.
Geology.
Mathematics.

Second Year.

SUBJECTS:

Agriculture.
Veterinary Pathology
Veterinary Surgery and Practice.
Book-Keeping.
Levelling and Surveying.
Agricultural Chemistry.
Economic Botany.
Entomology.
Meteorology.
English Literature.
Political Economy.

DEPARTMENTS OF INSTRUCTION.

1.—Agriculture.

Introduction.—*History of Agriculture*—Ancient, mediæval, modern; *Literature*—standard works, reports of societies, periodicals; *Varieties of Farming*—dairy, stock, ordinary mixed husbandry.

Soils.—Origin, distribution, physical properties and classification of soils; *Reclamation of lands*—Forest clearing—stumping, stoning, fallowing, etc.

Preparation of the Land for Crops.—Ordinary operations of tillage, ploughing, harrowing, cultivating, rolling, subsoiling, levelling, general cultivation most appropriate for the various kinds of soils.

Succession of Crops.—Importance and necessity of rotation, principles thereof, rotations suitable for various soils; crops—root, forage, cereal—treated with reference thereto.

Cultivation of Crops.—The various crops; *Cereals*—wheat, oats, barley, etc.; *Leguminous*—peas, beans, etc.; *Roots*—turnip, carrot, potato, etc.; *Forage or Herbage*—tare, lucerne, clovers, grasses, flax, hemp—cultivation most appropriate for each; *Seeds*—purchasing, testing, preparing, changing; *Sowing*—kind and quantity of seed, method of sowing; *After cultivation—harvesting—consumption*, or preparing for market, cost of production, laying land down to grass, management of grass and pasture land.

Improvement of Soils and Lands.—Improvement by thorough ordinary cultivation, subsoiling; *Draining*—its value, principles, various methods of draining, formation, levelling for, materials used in formation, cost and remuneration; *Manuring*—farm-yard manuring; application, uses, and properties of *artificial manures*—lime, plaster, salt, bones, superphosphate, nitrate of soda, etc., etc.

Breeding, Rearing, and Feeding of Animals.—Horses suited for agricultural purposes, various breeds, breeding, feeding, and general management; *Cattle*—characteristics of the various breeds—Shorthorns, Herefords, Devons, Ayrshires, etc.; methods of breeding, cross-breeding, in-and-in breeding, pedigree system, rearing young stock, the fattening process, relation of food to increase, dairy management, butter and cheese management, the factory system, realization; *Sheep*—characteristics of various breeds, long wools, medium wools, short wools, breeding and management of ewe flock, winter and spring feeding, rearing of lambs, relation of food to increase; Wool—texture, quantity and quality, dipping and salving, quantity maintained per acre; *Swine*—characteristics of the various breeds, breeding and management of sows, fattening, relation of food to increase, bacon curing; *Poultry*—characteristics of the various breeds, general management.

Implements of the Farm.—Mechanical principles entering into their construction; ploughs, harrows, cultivators, other tillage implements, sowing machines, grass seed and manure distributors; mowing and reaping machines; hay-making and harvesting machines, threshing and dressing machines; barn implements; waggons, sleighs, carts; straw cutters, turnip cutters and pulpers, implements used in stock-feeding, common, steaming; implements of less general use.

General Economy of the Farm.—Laying out a farm, formation and management of roads and lanes; *Fences*—varieties, position, mode of construction, materials, movable fences, hurdles; *Hedges*—varieties, methods of planting, after cultivation; *Buildings*—dwellings, out-buildings, stables, barns, sheds—principles of construction, plans and specifications.

General Business of the Farm.—Capital necessary, values and prices of land, stock, implements and improvements, value of all kinds of labour, making of inventories, keeping of stock and produce registers; *Markets*—economical laws regulating them, customs affecting them, modes of buying and selling, common laws relating to agriculture, relation of agriculture to the other industries.

Arboriculture.—Application to the American continent, different kinds of trees—occurrence, habits, uses, values—value of timber as a crop, raising of trees from the seed bed, what parts of the country should be planted, planting operations, transplanting large trees, enclosing and draining planted ground, management of trees with a view to shelter and economy.

Miscellaneous Subjects.

2.—Horticulture.

Occasional lectures are all that are yet given in this important department. The course of practical work, however, is extensive.

3.—Science.

I.—Chemistry.

Chemical Physics.—Force and matter, correlation of force, properties of matter, gravity, cohesion, heat—light, magnetism—electricity; forms of matter, liquids, solids, gases.

Inorganic Chemistry.—Scope of chemistry, atomic theory, chemical affinity, the *non-metallic* elements—oxygen, hydrogen, water—its nature, occurrence, functions, states and decomposition, nitrogen, the atmosphere, ammonia, its sources and important uses, oxides of nitrogen, nitric acid and its importance to plants, sulphur and its compounds, sulphuric acid, its manufacture and uses, phosphorus, the agricultural importance of phosphoric acid, carbon, silicon, flint, sand, silicates, chlorine, bromine, iodine, etc.;

The metals—the alkalies, sodium, potassium, soda, salt; calcium, lime, plaster; lead and its compounds; iron—its ores and manufactures; arsenic—its compounds and detection—gold, silver, platinum, tin, etc., etc., occurrence and uses, alloys.

Organic Chemistry.—Scope of the divisions of the science, organic compounds derived directly or indirectly from plants and animals, artificial formation of organic compounds, classification of organic bodies and their complexity, determination of the empirical and rational formulæ of organic bodies. *Wood Spirit* and its derivatives, methyl compounds, chloroform, acetic acid and its compounds, alcohol and the process of fermentation, constitution of oil and fats, manufacture of soap and candles; *starch and sugar*, and the other amyloids and glucoids—manufacture of sugar, tartaric, lactic, citric, and malic acids. The flesh-formers or albuminoids and their congeners; *Essential oils and resins*—varnishes, petroleum; *Vegetable Alkaloids*—quinine, strychnia; aniline dyes; urea and uric acic; *Animal Chemistry. Vegetable Chemistry.*

Agricultural Chemistry.—History of the connection between agriculture and chemistry, the food of plants, the origin and nature of soils, analysis of soils, relation of different plants to the soil, composition of different crops, chemical changes during the growth of different plants, rotation of crops, manures—special and general, the composition of farmyard manure, nature and analysis of guanos and superphosphates, other manures, feeding of animals, foods, ingredients of foods, relation of increase to composition of food, economy of food.

Practical Chemistry.—Chemical manipulation—the practical testing of waters, soils, foods, superphosphates, and other manures, and the preparation of the common gases, and the common acids.

Analytical Chemistry.—Qualitative and quantitative analysis, especially the analysis of soils, manures and farm produce.

(*a*) *Through all the courses, both of laboratory and experimental lectures, a constant endeavour is made to illustrate the principles of the pure science of Chemistry, on which the whole teaching is based, by Agricultural examples.*

II.—Natural History and Entomology.

Botany.—*Structural and Physiological*—internal structure of plants, cells and vessels, construction and development of the external parts of plants, root, stem. leaf, flower, seed, fruit, physiology of cells and vessels, chlorophyll, starch, gum, sugar, crystals, etc., movement of fluids and gases, nutrition and respiration, reproduction, methods of fertilization, hybridization, varieties, propagation, budding, division: diseases of plants, smut, rust, mildew, etc.

Systematic and Economic Botany.—Special morphology and general classification of plants, flowerless plants, mosses, ferns, fungi, etc.; flowering plants, characters of larger divisions. The orders containing important agricultural and economic plants, the cereals, grasses, roots with geographical distribution, agricultural seeds and fruits.

Zoology.—Nature of life, vital force, differences between animals and plants, differences between different animals, morphology and physiology, definition of species, origin of species, classification, characters of the general classes and orders of the *Invertebrates*, with examples. Special study of *Infusoria*, *Scolecida*, *Annelida*, and *Insecta*. General characters of the *Vertebrates*—the various orders, with morphological and physiological distinctions of each, illustrated by common examples. Special study of the families of *Aves*, containing the insectivorous birds, and the families of the *Mammalia*, containing all the various farm animals. Comparative anatomy and physiology of farm animals.

Entomology.—Structure and physiology of insects, metamorphoses of insects, senses of insects, insects injurious to vegetation, to growing plants; to fruits, the apple, plum, pear, peach, small fruits, etc.

III.—Geology, Physical Geography and Meteorology.

Geology.—Geological epochs, classification of rocks, structure, stratification, cleavage, foliation, dip, fault, denudation; elevation and depression of land; disintegration of rocks by aqueous and atmospheric agencies, formation of soils, Canadian geology.

Physical Geography and Meteorology.—Connection between physical geography and geology, distribution of land and water, superficial configuration of Ontario, theory of wells and springs. *History and scope of meteorology*—weight of atmosphere, how ascertained, *barometer*—various kinds, manipulation; *Temperature*—how observed and calculated—*thermometer*—varieties, Fahrenheit, centigrade, etc., use of each, manipulation; solar and terrestrial radiation, moisture of the atmosphere; mists, fogs, clouds; rain, snow, hail; winds and storms; miscellaneous, causes affecting the climate, influence of climate on vegetation.

4.—Veterinary Science.

Anatomy and Physiology of the Domestic Animals.—Horse, ox, sheep, pig. Osseous system, muscular system, syndesmology, plantar system, odontology, digestive, system, circulatory system, respiratory system, urinary system, nervous system, sensitive system, generative system, tegumental system.

Veterinary Pathology.—Osseous system, giving the nature, causes, symptoms, and treatment of the various diseases of bone as splint, spavin, ringbone, etc.

Muscular System—nature, causes, symptoms, and treatment of flesh wounds, etc.

Syndesmology—nature, causes, symptoms, and treatment of bog spavin, curb, and other diseases of joints.

Plantar System—nature, causes, symptoms, and treatment of corns, sand-crack and other diseases of the foot.

Odontology—describing the diseases of the teeth; also the mode of determining the age of the animals by the same.

Digestive System—nature, causes, symptoms, and treatment of spasmodic and flatulent colic, inflammation of the bowels, acute indigestion, tympanitis in cattle, impaction of the rumen, and many other common diseases.

Circulatory System—describing the diseases of the heart and blood vessels.

Respiratory System—nature, causes, symptoms, and treatment of catarrh, nasal gleet, roaring, bronchitis, pleurisy, inflammation of the lungs, etc.

Urinal System—nature, causes, symptoms, and treatment of inflammation of the kidneys, etc.

Nervous System—nature, causes, symptoms, and treatment of lock-jaw, string-halt, etc.

Sensitive System—nature, causes, symptoms, and treatment of the diseases of the eye and ear.

Generative System—nature, causes, symptoms, and treatment of abortion, parturition, milk fever, etc.

Tegumental System—nature, causes, symptoms, and treatment of scratches, sallenders, mallenders, parasites, and other diseases of the skin.

Materia Medica.—Giving the prepartion, actions, uses, doses, of over one hundred of the principal medicines used in Veterinary practice.

General Subjects.—The external form of the horse, thorough-breds, half-bred hunters, harness animals, draught animals. The external forms of stock, breeding, selection of animals, crosses, transmission of hereditary diseases; spavin, splints, side bones, ring-bones, grease, blindness, roaring, etc., and their remedies, sterility, abortion, general management to produce successful gestation, parturition, natural and præternatural presentations, their treatment. The management of young stock, weaning, feeding, method of preventing blood disease. The feeding of animals, ventilation, water, stabling. The influence of climate upon animals.

Demonstration of Anatomy in the Dissecting Room.

5.—English and Political Economy.

English.—*Review of past school work.*—study of etymological, syntactical and rhetorical forms of the English language, history of its formation, elements entering into it, its connection with other languages. Analytical study of one of Shakspeare's plays, and of extracts from some of the other English classics each year. *English composition*—the sentence, the paragraph, rhetorical figures, their use and abuse, species of compo-

sition, qualities of style, varieties of style. Essay writing, familiar and business correspondence.

Political Economy.—Wealth, labour, capital. Production, distribution, exchange, government, and the position that agriculture holds in each; relation of agriculture to all the other industries of a nation.

6—Mathematics.

Mathematics.—*Arithmetic—Review of past work in arithmetic, with special view to farm accounts*—tables of weights and measures, proportion, interest, discount, partnership, square and cube roots; *Mental Arithmetic: Mensuration*—the mensuration of every kind of surface, including the quantity of land cultivated by various machines, the surface occupied by different crops, the measurement of solids, including the contents of tanks, ditches, wells, manure heaps, walls, the materials for roads, timber, etc. *Surveying* in its commoner branches, fields surveyed with the chain and cross-staff, heights and distances found by the use of the theodolite, levelling practised. *Mechanics*—methods for calculating the weights of different materials, the units of work performed by various agents in the execution of particular works, the strength of materials, the mechanical powers, friction, the steam engine, etc. Those parts of dynamics which have reference to agricultural machinery, such as centrifugal force, accumulated work.

II.—COURSE OF APPRENTICESHIP.

The pupils are daily distributed to each of the following departments:

1. The Live Stock Department.
2. The Field Department.
3. The Horticultural Department.
4. The Mechanical Department.
5. The Experimental Department.

They are taught the manner of performing the various operations in each department by the instructor or his assistants in that department; and being distributed alternately to each, it is expected that at the end of two years a thorough apprenticeship will have been served.

The instruction received in the class-room is, as far as possible, illustrated and exemplified in the fields, yards and shops. The following may be taken as a few of the operations, in the performance of which apprenticeship is served:

Field Department.—Cleaning, harnessing and management of horses, ploughing, harrowing, cultivating, drilling, subsoiling, sowing, broadcast and by drill, planting, hoeing and grubbing, haying—by scythe and mower, harvesting by cradle and reaper, stoning, threshing, winnowing, marketing, draining, levelling, land measuring, stumping, logging, chopping, etc., etc.

Live Stock Department.—Cutting, pulping, steaming, mixing, feeding, cleaning, and general management of *cattle*. Feeding, lambing, shearing, castration, dipping, salving, hurdling, and general management of *sheep*. Feeding and general management of other stock.

Horticultural Department.—Digging, ploughing, raking, seeding, planting, hoeing, mowing, harvesting, storing, and general management of vegetables, flowers and lawn. Pruning, grafting, budding, mulching, cleaning, harvesting and storing, and general management of an orchard. General management of propagating-houses, greenhouses, vinery, nursery, hedges, walks and roads, etc., etc.

Mechanical Department.—Planing, sawing, nailing, grooving, matching, mortising, framing and general use of commoner mechanical tools. Fencing, hurdle making, gate making, and management of general farm improvements. Repairs of all farm buildings, implements, machines, etc., etc.

SESSIONS AND EXAMINATIONS.

For those taking the regular course there are two Sessions in the year—a Winter and a Summer Session. The former commences on the first of October, the latter on the 16th of April.

There is a vacation at the end of each Session.

Examinations, which every student is required to pass, are held at the close of the Session—in each inside Department, on the subjects of Lectures in that Department, for the Session; and in each outside Department, on the work of that Department for the Session.

For those taking the special course there is but one Session—the Winter Session—extending from the first of October to the end of March. To those who pass the requisite examinations, not only in the regular studies, but in the special ones likewise, this Session counts as a year, and is so designated.

DIPLOMAS.

A diploma is given to each student who completes his course of study, and passes satisfactorily all examinations, both on the subjects contained in the curriculum, and on the work of his apprenticeship.

RESIDENCE, LABOUR, FEES, REMUNERATION.

1.—Regular Course.

It is desirable that all students taking the regular course should reside in the building. As the city, however, is distant but a mile and a half, students may board in it and attend lectures.

The number of hours of labour for regular students varies with the season of the year, but the arrangements are such that an annual daily average of not more than five hours is enforced.

Tuition, $25 a year for ratepayers and *bona fide* residents of the Province of Ontario; for all others, $50 a year.

Board and washing charged at cost.

For skilled work, faithfully and zealously performed, ten cents an hour is paid—for all other in proportion.

By this arrangement the cost of education is reduced to a minimum:

1st. The entire cost to an Ontario farmer's son, able and willing, with considerable experience in farm work, is $35 to $50 a year for *board*, *washing*, and *tuition*.

2nd. To an Ontario student without any previous knowledge of farming, $45 to $65 a year.

3rd. To non-residents, $65 to $85 a year.

2.—Special Course.

The special course, as stated above, commences on the 1st of October and ends 1st of April. It is intended for farmers' sons, or others engaged in that occupation, who desire to attend lectures during the winter, and return home in time for the spring work on their own farms. Such students doing little or no manual labour, are enabled to take a whole year's lectures in the Winter Session, which counts as a year.

Tuition $25 for the session to ratepayers and *bona fide* residents of the Province of Ontario; to all others, $50.

Board and washing charged at cost—$2.18 to $2.20 a week.

No opportunity of defraying expenses can be promised to students taking this course, but if work be required of them they will be paid at the same rates as other students.

GENERAL RULES.

I.—Students are Required

1. To render cheerful and willing obedience to orders.
2. To conduct themselves in a gentlemanly and orderly manner at all times.
3. To avoid all noisy or boisterous conduct in or about the building.
4. To observe neatness of dress at prayers, meals and lectures, and tidiness in their rooms.

II.—The Following Practices are Absolutely Forbidden:—

1. Swearing, improper language, and gambling.
2. Use of intoxicating liquors, cards, or fire-arms.
3. Use of tobacco while on detail, in or about the building, or in any place except in the smoking room.
4. Entering domestic or private apartments without permission.
5. Absence without leave.
6. Cutting, marking, or in any way defacing the College buildings or furniture.

GENERAL REGULATIONS.

1. All students who reside in the building are under the charge of the President.
2. A register is kept of the attendance of students at prayers, work and lectures.
3. All students must attend morning and evening prayers, unless exempted from doing so in consequence of the objection of their parents and guardians.
4. They are required regularly to attend their respective places of worship on Sabbath forenoon.
5. No student is allowed to be absent from the institution after seven o'clock in the evening, except by permission of the President.
6. Students are provided with everything in the shape of furniture, bedding, towels, etc., that may be requisite, but each is accountable for every such article placed at his disposal.
7. Every student damaging or breaking anything is required to report the same, that the value of the repairs may be charged to his account.
8. The morning bell is rung at 5.45 a.m.; bell for morning prayers, at 6 a.m.; breakfast, at 6.30 a.m.; farm bell, at 7 a.m.; school bell, at 9 a.m.; farm bell, at 12 noon; dinner, at 12.30 p.m.; farm and school bells, at 1.30 p.m.; farm and school bells, at 5 p.m.; tea, at 5.30 p.m.; school bell, at 7 p.m.; bell for evening prayers, at 9 p.m.; lights out at 10 p.m., and doors locked at 10.30 p.m.
9. The President is authorized to impose fines and other penalties, for the infraction of rules and regulations.
10. No student whose moral conduct, industrial or intellectual progress is unsatisfactory to the staff, will be allowed to remain at the institution.

GENERAL REMARKS.

A few general remarks on the appliances and advantages possessed by this institution for training young men for agricultural pursuits may be given in conclusion.

Classes of Students.

There are in our Province, as a general rule, at least three classes of young men whom an institution of this kind can benefit. The first class are those who, from our cities and towns, or from other countries, with or without a small capital at their command, desire to serve an apprenticeship at farm work. The second class is farmers' sons, or the sons of those closely connected with that occupation, who wish to complete their education before commencing their life-work. Both of these are provided for in our regular course. And lastly, there are farmers' sons or others engaged in farming who desire to obtain an agricultural education, but cannot remain with us during the summer months. These are provided for in the special course. By taking that course, they can do a year's work in the winter session, be back on their own farms in time to commence their spring work, and return to college again in the fall.

Teaching Appliances on the Farm.

The farm itself is being gradually laid out, cleaned, and drained, and the students assist in these operations. The best and most approved farm implements and machinery are used. The possession of seven breeds of cattle, five of sheep, and three of swine, is in itself an important advantage for the purposes of instruction. Besides this, there are in the immediate neighbourhood several herds which are frequently inspected by the students. In the adjacent city, monthly fairs, fat cattle shows, and a central exhibition are held. All of these are visited by the students, who regularly report on what they have observed.

Experiments.

A portion of the farm has been laid out in experimental fields and plots, and regular systematic experiments with varieties of grasses, cereals and roots, with different manures and different modes of cultivation, are carried on. In these the second year students, as far as practicable, are engaged. Besides these field experiments, others in the feeding of live stock are made during the winter, to test the several breeds and the comparative values of different kinds of food. The benefit of such experiments to the Province need not be pointed out. The discovery of one or two really good varieties of wheat, oats or pease would not only cover all expenses, but pay for the place itself in a couple of years by their value to the country. Without mentioning this, however, it will be seen that second years' students are trained in the modes of carrying out experiments.

Teaching Appliances in the School.

These are constantly being added to, although in the meantime they are not so numerous as might be desired. Especially is the want felt in the department of the Professor of Chemistry, for as yet there is but a small working laboratory in connection with the institution. Appliances in a school are usually the growth of years, and with five teachers—masters of their subjects—the College may be said to be fairly equipped.

Veterinary Department.

This most important department has been fully organized and is doing good work. A complete skeleton of a horse and all the principal bones of ordinary farm animals have been provided for the class-room. When an animal dies from disease or any other ailment, it is dissected, the cause or causes of death sought for and pointed out in presence of the classes. Thus the work is made as practical as possible.

Library and Reading Room.

The library is well selected, and, though small, is being constantly augmented. The reading-room is furnished by the College with daily and weekly newspapers, with some half-dozen general periodicals, and the leading agricultural papers of Canada, the United States and Great Britain. Several papers are likewise provided by the Literary Society.

Advantages of the Course.

Besides becoming fairly skilled in the work of a farm, the student takes part in the cultivation of a garden, and thus increases his knowledge and improves his taste in a very important direction. He also acquires skill in the use of tools, so that afterwards he is not only able to make his own repairs, but knows when such work is properly done. He sees for himself the effects of various rotations and different modes of cultivation, and becomes acquainted, on the experimental ground, and in the class-room, with many varieties of grasses, grains, roots, and manures. The different breeds of cattle, sheep and swine, of common use in Canada, become familiar to him from daily contact with them; and the excellencies and defects of each he learns by lectures in the class-room, and by reference in the yards. He is taught how to keep live stock registers, accounts of field cropping, and regular farm accounts. By personal observation he learns the routine of auction sales, of ordinary fairs and stock markets, and of the common grain market. He becomes acquainted with the prices of stock, implements and produce, with the cost of building and improvements—in a word, he is prepared to transact the *business* of a farm. He obtains in the Veterinary Department a knowledge of the structure and functions of farm animals, and the most approved methods of treating and preventing the ordinary diseases to which such animals are liable. The study of the relations of the plant, the soil, and the animal to each other, and to his profession, under the heads of Botany, Chemistry, etc., not only shows him the reasons for the rules of the best farm practice, and enables him afterwards to discover other such rules, but likewise forms in him habits of reasoning closely, systematically and correctly, which cannot fail in after life to make him a better citizen. And, lastly, by this, as well as by the teaching in the class-room, by reading the standard works in the library, and the newspapers and periodicals in the reading-room, by contact with his fellow students, and by discussions carried on with them in their Literary Society, his mind is sharpened and strengthened, his views widened, and his power of thinking and his ability to express his thoughts greatly increased.

If the student be careless, thoughtless, or lazy, few of those advantages will be reaped; but if he be attentive, energetic and diligent the majority of them will undoubtedly be secured.

APPENDIX B.

TIME TABLES FOR FALL TERM (1st October to Christmas), 1880.

Time table No. 1 gives the routine of the different years and divisions for the first week; time table No. 2, the routine of the same years and divisions for the second week, No. 1 and No. 2 having been followed alternately, for a week each, throughout the term.

TIME TABLE No. 1.—1st WEEK.

1st Year.—Division 1.

	Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
Forenoon.	7–8	Study or Recreation.	Study or Recreation.	Study or Recreation.	Study or Recreation.	Study or Recreation.	Half Holiday.
	8–9	Drill or Gymnastics.	Drill or Gymnastics.	Drill or Gymnastics.	Drill or Gymnastics.	Drill or Gymnastics.	
	9–10	Arithmetic.	Arithmetic.	Natural History.	English Composition.	English Literature.	
	10–11	Inorganic Chemistry.	Agriculture.	Inorganic Chemistry.	English Literature.	Agriculture.	
	11–12	Natural History.	Inorganic Chemistry.	Veterinary Anatomy.	Agriculture.	Veterinary Anatomy.	
Afternoon.	1.30–5	Work.	Work.	Work.	Work.	Work.	Work.

1st Year—Division II.

	Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
Forenoon.	7–12	Work.	Work.	Work.	Work.	Work.	Work.
Afternoon.	2–3	Arithmetic.	English Composition.	Natural History.	Natural History.	Arithmetic.	Half Holiday.
	3–4	Agriculture.	English Literature.	Agriculture.	Inorganic Chemistry.	Inorganic Chemistry.	
	4–5	Inorganic Chemistry.	Veterinary Anatomy.	Veterinary Anatomy.	English Literature.	Agriculture.	

2ND YEAR.

	Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
Forenoon.	7–12	Work.	Work.	Work.	Work.	Work.	Work.
Afternoon.	2–3	Agricultural Chemistry.	Levelling and Surveying.	Statics.	Meteorology.	Agricultural Chemistry.	Half Holiday.
	3–4	Veterinary Pathology.	Agriculture.	Agricultural Chemistry.	Agriculture.	English Literature.	
	4–5	Handling and Judging Horses.	English Literature.	Hand. & Judging Cattle or Sheep.	Levelling and Surveying.	Veterinary Pathology.	

TIME TABLE No. 2.—2ND WEEK.

1ST YEAR.—DIVISION I.

	Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
Forenoon.	7–12	Work.	Work.	Work.	Work.	Work.	Work.
Afternoon.	2–3	Arithmetic.	Arithmetic.	Natural History.	English Composition.	English Literature.	Half Holiday.
	3–4	Inorganic Chemistry.	Agriculture.	Inorganic Chemistry.	English Literature.	Agriculture	
	4–5	Natural History.	Inorganic Chemistry.	Veterinary Anatomy.	Agriculture.	Veterinary Anatomy.	

1ST YEAR.—DIVISION II.

	Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
Forenoon.	7–8	Study or Recreation.	Study or Recreation.	Study or Recreation.	Study or Recreation.	Study or Recreation.	Half Holiday.
	8–9	Drill or Gymnastics.	Drill or Gymnastics.	Drill or Gymnastics.	Drill or Gymnastics.	Drill or Gymnastics.	
	9–10	Arithmetic.	English Composition.	Natural History.	Natural History.	Arithmetic.	
	10–11	Agricultnre.	English Literature.	Agriculture.	Inorganic Chemistry.	Inorganic Chemistry.	
	11–12	Inorganic Chemistry.	Veterinary Anatomy.	Veterinary Anatomy.	English Literature.	Agriculture.	
Afternoon.	1.30–5	Work.	Work.	Work.	Work.	Work.	Work.

2ND YEAR.

	Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
Forenoon.	7–8	Study or Recreation.	Study or Recreation.	Study or Recreation.	Study or Recreation.	Study or Recreation.	Half Holiday.
	8–9	Drill.	Drill.	Drill.	Drill.	Drill.	
	9–10	Agricultural Chemistry.	Levelling and Surveying.	Statics.	Meteorology.	Agricultural Chemistry.	
	10–11	Veterinary Pathology.	Agriculture.	Agricultural Chemistry.	Agriculture.	English Literature.	
	11–12	Handling and Judging Horses.	English Literature.	Hand. & Judging Cattle & Sheep.	Levelling and Surveying.	Veterinary Pathology.	
Afternoon.	1.30–5	Work.	Work.	Work.	Work.	Work.	Work.

TIME TABLE No. 3.—SPECIAL COURSE.

1ST YEAR.—SPECIAL.

	Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
Forenoon.	7–8	Work.	Work.	Work.	Work.	Work.	Work.
	9–10	Arithmetic.	Arithmetic.	Natural History.	English Composition.	English Literature.	Holiday.
	10–11	Inorganic Chemistry.	Agriculture.	Inorganic Chemistry.	English Literature.	Agriculture.	
	11–12	Natural History.	Inorganic Chemistry.	Veterinary Anatomy.	Agriculture.	Veterinary Anatomy.	
Afternoon.	2–3	Study.	Study.	Study.	Study.	Study.	
	3–4	Book-keeping.	Geology and Phys. Geog.	Botany.	Veterinary Mat. Med.	Study.	
	4–5	Mensuration.	Agriculture.	Study.	Agriculture.	Geology and Phys. Geog.	

2ND YEAR.—SPECIAL.

	Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
Forenoon.	7–8	Work.	Work.	Work.	Work.	Work.	Work.
	9–10	Agricultural Chemistry.	Levelling and Surveying.	Statics.	Meteorology.	Agricultural Chemistry.	Holiday.
	10–11	Veterinary Pathology.	Agriculture.	Agricultural Chemistry.	Agriculture.	English.	
	11–12	Handling and Judging Horses.	English.	Hand. & Judging Cattle or Sheep.	Levelling and Surveying.	Veterinary Anatomy.	
Afternoon.	2–3	Study.	Economic Botany.	Agriculture.	English.	Study.	
	3–4	Book-keeping.	Dynamics.	Study.	Study.	Practical Chemistry.	
	4–5	Study.	Veterinary Mat. Medica.	Practical Chemistry.	Economic Botany.	Practical Chemistry.	

APPENDIX C.

1.—COLLEGE ROLL FOR THE YEAR 1880.

2.—COLLEGE ROLL FOR THE SESSION 1880-'81 (1st Oct. to 31st March.)

1.—COLLEGE ROLL FOR THE YEAR 1880.

Name.	P. O. Address.	County, &c.
Anderson, Henry F	London	Middlesex.
Anderson, John P	Guelph	Wellington.
Ash, Wm. E	Thorold	Lincoln.
Atkinson, Geo. M.	Montreal	Montreal.
Armstrong, Christian	Knowlton	Quebec.
Armstrong, Francis	Knowlton	Quebec.
Ballantyne, Wm. W	Stratford	Perth.
Barclay, Edmund H	St. Andrews	Scotland.
Batty, Jonathan	Meaford	Grey.
Bignell, Edward	Claude	Peel.
Bethune, Kenneth	Ottawa	Carleton.
Begg, Robert A	Bracebridge	Victoria.
Bell, James	Montreal	Montreal.
Beaudet, George	Quebec	Quebec.
Blake, Oliver C	Waterford	Norfolk.
Blanchard, Monson G	Windsor	Nova Scotia.
Bowman, Byron	West Montrose	Waterloo.
Brown, William	Guelph	Wellington.
Cushing, George	Kenilworth	Wellington.
Chipman, Percy H	Montreal	Montreal.
Charlton, Geo. A	St. George	Brant.
Clark, Donald	Bremar	Oxford.
Cuppage, Alexander	Orillia	Simcoe.
Condell, Geo.	Yorkville	York.
Cross, A. Ernest	Montreal	Montreal.
Chapman, Richard	Plymouth	England.
Clutton, Alexander	Millburn	Huron.
Clutton, John G	Millburn	Huron.
Campbell, D. P. L	Yankleek Hill	Prescott.
Craig, William	Abbottsford	Rouville.
Corwin, Arthur J	Drummondville	Welland.
Chase, Oscar	Cornwallis	Nova Scotia.
Carpenter, Chas	Simcoe	Norfolk.
Duthie, James	Guelph	Wellington.
Denman, Arthur W	Cranbrook	Huron.
Dickinson, Charles S	Seaforth	Huron.
Dickinson, Samuel	Zion	Durham.
Dunne, Peter	Ottawa	Carleton.
Dawes, Mark A	Montreal	Montreal.
Dennis, James F	Weston	York.
Davis, Robert A	York	Haldimand.

1.—COLLEGE ROLL FOR THE YEAR 1880.—*Continued.*

Name.	P. O. Address.	County, &c.
Douglas, Joseph	Blake	Huron.
Dewar, John D.	Tiverton	Bruce.
Dunlop, John	Woodstock	Oxford.
Dawson, John	South Zorra	Oxford.
Eglesion, George	Ancaster	Wentworth.
Elworthy, Robert	Norwich	Oxford.
Fenton, James	Rochdale	England.
Fotheringham, James	St. Mary's	Perth.
Fotheringham, William	St. Mary's	Perth.
File, John J.	Brantford	Brant.
Ferguson, George A.	Kingston	Frontenac.
Ffolkes, Edward	Hillington Lynn	England.
Gilpin, William	Ottawa	Carleton.
Green, Harry	Waterford	Norfolk.
Gibson, Robert	Glen Allan	Wellington.
Gibson, William J.	Ottawa	Carleton.
Gordon, William	Guelph	Wellington.
Grindley, Arthur W.	Wolfe's Island	Frontenac.
Grant, Peter	Thornyhurst	Lambton.
Grant, Robert, B.	Ottawa	Carleton.
Glass, William	East Zorra	Oxford.
Gibb, J. Gordon	Ottawa	Carleton.
Gaw, W. W.	Leadville	Colorado.
George, Alexander	Keith	Scotland.
Grant, William M.	Woodville	Victoria.
Goold, George E.	Kingston	Frontenac.
Hermon, Ernest B.	Rednersville	Prince Edward.
Horne, William H.	North Keppel	Grey.
Hill, James L.	Ottawa	Carleton.
Howitt, William	Guelph	Wellington.
Hogarth, George	Hespeler	Waterloo.
Holterman, Richard F.	Toronto	York.
Hogarth, Stephen J.	Exeter	Huron.
Hallesy, Frederick	Merthyr Tidfil	Wales.
Henderson, Daniel	Loch Winnoch	Renfrew.
Irving, Christopher H.	Hamilton	Wentworth.
Jackson, Charles S.	Brantford	Brant.
Joyce, Henry G.	Toronto	York.
Joy, Harold H.	Grimsby	Lincoln.
Job, John	Waterdown	Wentworth.
Jones, George F. B.	Hillier	Prince Edward.
Jones, George	Guelph	Wellington.
Jones, Frank C.	Guelph	Wellington.
Kippen, Horace B.	Lennoxville	Quebec.
Law, F. E.	Stratford	Perth.
Landsborough, John	Clinton	Huron.
Leask, John	Pinkerton	Bruce.
Lindsay, William D.	Woodstock	Oxford.
Lindsay, Samuel J.	Woodstock	Oxford.
Lomas, Joseph W.	Yorkville	York.
Lang, William	Ottawa	Carleton.
Lewis, William	Montreal	Montreal.
McNaughton, James M.	Laggan	Glengarry.
Motherwell, William R.	Perth	Lanark.
McIlquham, John J.	Lanark	Lanark.
McIlquham, William	Lanark	Lanark.
Minard, James H.	Sparta	Elgin.
McLachlan, Daniel	Toronto	York.
Mylne, Robert C.	Smith's Falls	Lanark.
McClelland, Henry	Hornby	Halton.
Maguire, Alexander	Sheldon	Simcoe.
Macaulay, Herbert R.	Hamilton	Wentworth.
McLaren, Harry	Montreal	Montreal.
McLaren, Peter	Perth	Lanark.
Macfarlane, David	Montreal	Montreal.
McArthur, John	Ailsa Craig	Middlesex.
McDonald, Robert	Dunvegan	Glengarry.
Macleod, Martin D.	Oak Ridges	York.
Myers, William	Guelph	Wellington.

1.—COLLEGE ROLL FOR THE YEAR 1880.—*Continued.*

Name.	P. O. Address.	County, &c.
Moore, Charles, J.	Toronto	York.
Matthewman, Ernest	Ottawa	Carleton.
McPhail, Ernest	Toronto	York.
Mahony, E. C	Hamilton	Wentworth.
Nicol, George	Cataraqui	Frontenac.
Newton, John	Weston	York.
Nelson, Jas. R.	Sorel	Richelieu.
Noble, Frederick	Toronto	York.
Nurse, Frank J.	Hamilton	Wentworth.
Ord, William	Toronto	York.
Pope, Albert L.	Sarawak	Grey.
Pope, Edward	Sarawak	Grey.
Pope, Herbert	Sarawak	Grey.
Phin, Richard J.	Hespeler	Waterloo.
Phin, William E.	Hespeler	Waterloo.
Perry, Herbert E.	Hollin	Wellington.
Patton, William	Montreal	Montreal.
Philbin, Thomas	Ottawa	Carleton.
Poe, James P.	Callan	Ireland.
Petapiece, William	Manotick	Carleton.
Robins, William P.	Beamsville	Lincoln.
Ross, James G.	Montreal	Montreal.
Ross, William J.	Smith's Falls	Lanark.
Reymond, Andrew	Ottawa	Carleton.
Roberts, Percy	Toronto	York.
Rustrick, Alfred	Hamilton	Wentworth.
Rae, William L.	Fitz-William Road	London, Eng.
Ramsay, Robert A.	Eden Mills	Wellington.
Rogers, Frederick	Deans	Haldimand.
Roblin, Adelbert G.	Rednerville	Prince Edward.
Redmond, Samuel	Peterboro'	Peterboro'.
Snyder, Elias	Burgessville	Oxford.
Surtees, William S.	Ottawa	Carleton.
Stinson, Lewis A.	Bloomfield	Prince Edward.
Small, Alexander T.	Ottawa	Carleton.
Sutherland, Alexander D.	Bennington	Oxford.
Silverthorn, Newman	Summerville	Peel.
Scott, Archie	Hastings	Northumberland.
Segsworth, Frederick	Monck	Wellington.
Stubbs, William H.	[illegible]worth	Wellington.
Skaife, John	[illegible]	Montreal.
Switzer, William G.	Palermo	Halton.
Stover, John W.	Norwich	Oxford.
Shaver, Charles B.	Stratford	Perth.
Schüll, Charles	Guelph	Wellington.
Stonehouse, Marshall	Shirley	Ontario.
Smith, Miles H.	Oakville	Halton.
Shuttleworth, Arthur	Mount Albert	York.
Sherer, Edward	Ottawa	Carleton.
Torrance, W. Percy	Guelph	Wellington.
Templer, William	Jerseyville	Wentworth.
Tronson, Harold	Oakville	Halton.
Terhune, Frederick	Brantford	Brant.
Willis, Thomas	Whitby	Ontario.
Wilson, Samuel J.	Bosworth	Wellington.
Wilson, William A.	Ottawa	Carleton.
Webster, Lindsay	Yarmouth	Nova Scotia.
Watt, James M.	Montreal	Montreal.
Watt, D. A.	Montreal	Montreal.
Ward, Thomas M.	Stanhope	Prov. of Quebec.
White, William G.	Lanark	Lanark.
White, Charles	Lanark	Lanark.
Wettlaufer, Frederick	Tavistock	Perth.
Williams, Albert	Culloden	Oxford.
Woodley, Francis E.	Quebec	Quebec.
Wyndham, Walter	Roach's Point	York.
Total		176

2. COLLEGE ROLL FOR THE SESSION 1880-81 (1st Oct. to 31st March).

Name.	P. O. Address.	County, &c.
Anderson, Henry F.	London	Middlesex.
Anderson, John P	Guelph	Wellington.
Armstrong, Christian	Knowlton	Quebec.
Armstrong, Francis	Knowlton	Quebec.
Ballantyne, William W	Stratford	Perth.
Begg, Robert A	Bracebridge	Victoria.
Bignell, Edward	Claude	Peel.
Blanchard, Monson	Windsor	Nova Scotia.
Barclay, Edmund H	St. Andrews	Scotland.
Blake, Oliver C	Waterford	Norfolk.
Batty, Jonathan	Meaford	Grey.
Bowman, Byron	West Montrose	Waterloo.
Bethune, Kenneth	Ottawa	Carleton.
Beaudet, George	Quebec	Quebec.
Bell, James	Montreal	Montreal.
Brown, William	Guelph	Wellington.
Cuppage, Alexander	Orillia	Simcoe.
Cross, Alfred E	Montreal	Montreal.
Clutton, John G	Millburn	Huron.
Corwin, Arthur J	Drummondville	Welland.
Chase, Oscar	Cornwallis	Nova Scotia.
Carpenter, Charles	[illegible]imcoe	Norfolk.
Chipman, Percy H	[illegible]ontreal	Montreal.
Charlton, George A	St. George	Brant.
Dickinson, Charles S	Seaforth	Huron.
Dickinson, Samuel	Zion	Durham.
Dennis, James F	Weston	York.
Douglas, Joseph	Blake	Huron.
Dewar, John D	Tiverton	Bruce.
Dunlop, John	Woodstock	Oxford.
Dawson, John	South Zorra	Oxford.
Elworthy, Robert	Norwich	Oxford.
Egleston, George	Ancaster	Wentworth.
Fotheringham, James	St. Mary's	Perth.
Fotheringham, William	St. Mary's	Perth.
File, John J	Brantford	Brant.
Ferguson, George A	Kingston	Frontenac.
Ffolkes, Edward	Hillington Lynn	England.
Gilpin, William	Ottawa	Carleton.
Green, Harry	Waterford	Norfolk.
Gibson, Robert	Glen Allan	Wellington.
Grindley, Arthur W	Wolfe's Island	Frontenac.
Glass, William	East Zorra	Oxford.
Gibson, William J	Ottawa	Carleton.
Gibb, J. Gordon	Ottawa	Carleton.
Gaw, W. W	Leadville	Colorado.
George, Alexander	Keith	Scotland.
Grant, William M	Woodville	Victoria.
Goold, George E	Kingston	Frontenac.
Horne, William H	North Keppel	Grey.
Hill, James L	Ottawa	Carleton.
Howitt, William	Guelph	Wellington.
Holterman, Richard F	Toronto	York.
Hallesy, Frederick	Merthyr Tidfil	Wales.
Henderson, Daniel	Loch Winnoch	Renfrew.
Job, John	Waterdown	Wentworth.
Jones, George B	Guelph	Wellington.
Kippen, Horace B	Lennoxville	Quebec.
Law, F. E	Stratford	Perth.
Landsborough, John	Clinton	Huron.
Leask, John	Pinkerton	Bruce.
Lindsay, William D	Woodstock	Oxford.
Lindsay, Samuel J	Woodstock	Oxford.
Lewis, William	Montreal	Montreal.
McNaughton, James M	Laggan	Glengarry.
Motherwell, William R	Perth	Lanark.
McIlquham, John	Lanark	Lanark.
McIlquham, William	Lanark	Lanark.
Mylne, Robert C	Smith's Falls	Lanark.
Macaulay, Herbert R	Hamilton	Wentworth.

2.—COLLEGE ROLL FOR THE SESSION 1880-81. *Continued.*

Name.	P. O. Address.	County, &c.
McFarlane, David	Montreal	Montreal.
McArthur, John	Ailsa Craig	Middlesex.
Macleod, Martin D.	Oak Ridges	York.
Myers, William.	Guelph	Wellington.
Moore, Charles J.	Toronto	York.
Matthewman, Ernest	Ottawa	Carleton.
McPhail, Ernest	Toronto	York.
McLaren, Peter	Perth	Lanark.
Mahony, E. C.	Hamilton	Wentworth.
Nicol, George	Cataraqui	Frontenac.
Newton, John	Weston	York.
Noble, Frederick	Toronto	York.
Ord, William	Toronto	York.
Pope, Edward	Sarawak	Grey.
Pope, Herbert E.	Sarawak	Grey.
Phin, Richard J.	Hespeler	Waterloo.
Phin, William E.	Hespeler	Waterloo.
Patton, William	Montreal	Montreal.
Phillbin, Thomas	Ottawa	Carleton.
Poe, James P.	Callan	Ireland.
Petapiece, William	Manotick	Carleton.
Robins, William F.	Beamsville	Lincoln.
Ross, William J.	Smith's Falls	Lanark.
Ross, James G	Montreal	Montreal.
Rae, William L.	Fitz-William Road	London, Eng.
Ramsay, Robert A.	Eden Mills	Wellington.
Rogers, Frederick	Deans	Haldimand.
Roblin, Adelbert G.	Rednerville	Prince Edward.
Redmond, Samuel	Peterboro'	Peterboro'.
Surtees, William S.	Ottawa	Carleton.
Small, Alexander T.	Ottawa	Carleton.
Silverthorn, Newman	Summerville	Peel.
Scott, Archie	Hastings	Northumberland.
Segsworth, Frederick	Monck	Wellington.
Skaife, John	Montreal	Montreal.
Stover, John W.	Norwich	Oxford.
Shaver, Charles B.	Stratford	Perth.
Schüll, Charles	Guelph	Wellington.
Stonehouse, Marshal	Shirley	Ontario.
Smith, Miles H.	Oakville	Halton.
Shuttleworth, Arthur	Mount Albert	York.
Sherer, Edward	Ottawa	Carleton.
Torrance, W. Percy	Guelph	Wellington.
Templer, William	Jerseyville	Wentworth.
Tronson, Harold	Oakville	Halton.
Terhune, Frederick	Brantford	Brant.
Willis, Thomas	Whitby	Ontario.
Woodley, Francis E.	Quebec	Quebec.
Wilson, William A.	Ottawa	Carleton.
Watt, James M.	Montreal	Montreal.
Watt, D. A.	Montreal	Montreal.
Ward, Thomas M.	Stanhope	Quebec.
White, William G.	Lanark	Lanark.
White, Charles	Lanark	Lanark.
Wyndham, Walter	Roach's Point	York.
Wettlaufer, Frederick	Tavistock	Perth.
Williams, Albert	Culloden	Oxford.
Total		126

APPENDIX D.

ONTARIO AGRICULTURAL COLLEGE.

EXAMINATION PAPERS.

I. PAPERS SET AT SESSIONAL EXAMINATIONS, EASTER, 1880.
II. PAPERS SET AT SESSIONAL EXAMINATIONS, JUNE, 1880.
III. PAPERS SET AT MATRICULATION EXAMINATION, OCTOBER, 1880.

I. PAPERS SET AT THE SESSIONAL EXAMINATIONS, EASTER, 1880.

FIRST YEAR.—(FIRST PAPER.)

AGRICULTURE.

Examiner: W. Brown.

1. Give a full description of the accompanying samples of wheat as regards plumpness, structure, form, quality and evenness of sample.
2. What is considered to be the most approved mode of making and preserving farm-yard manure; and by what principles and facts should we be guided in its application to varous crops?
3. Sketch the general management of a root crop in a system of mixed farming.
4. In the fattening of cattle, what regulates the kind, quantity and condition of the food, and by what circumstances are the results influenced?
5. Tell all you know about the kinds of crops best suited for green fodders, and briefly explain the plan of cattle feeding called "soiling."
6. Enumerate the various points to be attended to in securing and maintaining permanent pastures.
7. What are our principal special manures, and their most important properties?

FIRST YEAR.

AGRICULTURE: THE FIELD.

Examiner: Wm. Brown.

1. Explain why rotation in cropping is necessary, how it is generally conducted on soils of average texture in Ontario, and show the changes in the systems to suit lighter and heavier lands.

2. The arrangement of details in farm buildings should embrace, among others, economy of labour in management, ventilation, drainage, light, warmth and manure preservation. Show by illustration how these may best be secured.

3. The construction of roads and fences is conducted upon certain principles to secure certain objects. Explain these fully by illustrations and notes.

4. Land is under-drained primarily for the removal of superfluous water. What other advantages invariably follow this operation?

5. Lay off a field and illustrate by a sketch the meaning of the terms *main*, *lateral*, *herring-bone*, and *outlet*.

FIRST YEAR.

AGRICULTURE—LIVE STOCK.

Examiner: W. Brown.

1. By what circumstances should the Ontario farmer be guided in the selection of certain breeds, and what particular breeds of cattle, sheep, horses and swine, for specific purposes?

2. How are Britain and the American continent at present regulated in respect to pedigree of cattle and the marking of Berkshire swine?

3. When we wish to obtain the quickest returns for our field produce in the shape of beef and mutton, what breeds do we choose, and by what circumstances are individuals of them selected?

4. Take the Shorthorn, Hereford, Devon, Ayrshire, Alderney, Galloway, and Aberdeen Polled cattle, give 10 marks for each, and make a comparative table of beefing and milking properties.

5. We want a kind of sheep combining size of frame, with points, hardiness, medium wool of good quality, good flesh, and with power to improve others; which of the breeds on our farm come nearest these essentials, and in what way have they been brought about?

6. We want a horse to drive to market, plough, jump a fence under saddle, and trot 12 miles an hour; what special form should such an animal possess?

FIRST YEAR.

PRACTICAL EXAMINATION ON LIVE STOCK.

Examiner: W. Brown.

Cattle.

Subjects to be examined: { Shorthorn Bull. / Ayrshire Cow. / Shorthorn Grade Cow.

1. Show the weak points of the bull.
2. What are his best points?
3. What are the indications in this bull of good beefing properties?
4. Judge this cow as a milker.
5. Which of the cows would mate best with the bull for beefing purposes, and why?

Sheep.

Subjects to be examined: { Leicester Ram. / Cotswold Ram. / Southdown Ram (1) / Southdown Ram (2) / Oxford Down Ram. / Oxford Down Grade Wether.

1. Distinguish the characteristic points of the Leiccester and Cotswold.

2. Which is the best long-wooled fleece of the lot as regards density and soundness?
3. Which is the oldest and the youngest sheep of the lot?
4. Compare the Wether with the Oxford Down, and say wherein they agree or differ, as regards carcass and wool.
5. Judge the oldest Southdown by the standard used for the breed.

FIRST YEAR.

INORGANIC CHEMISTRY.

Examiner: J. Hoyes Panton, M.A.

1. Distinguish between an atom and a molecule, giving examples of each. Name the results which occur when chemical affinity takes place, and by what means can it be assisted.
2. Vessels are placed before you containing elements and compounds represented by the symbols—H, H Cl, N, N_2 O, Co_2, H N O_3, Na_2 C O_3, Ca S O_4. Classify these into solids, liquids, gases, and indicate which are bases, acids and salts.
3. Give the preparation and properties of the elements found in the atmosphere.
4. Explain what takes place when potassium is burnt on water. How would you distinguish the resulting compound from that formed by sodium burnt on water?
5. Explain the action of the Bunsen burner.
6. Give the sources of phosphorus and the formulas for the different phosphates of lime, stating which is the superphosphate.
7. Classify the metals of greatest importance in Agricultural Chemistry, and write notes on those which enter into the composition of clay and marly soils.
8. Name the different kinds of galvanic batteries used in the generation of electricity. What are the common errors made in the erection of lightning rods?
9 How do the following occur in nature:—ammonia, silver, potash, phosphoric acid and iron?

FIRST YEAR.

ORGANIC CHEMISTRY.

Examiner: J. Hoyes Panton, M.A.

1. What is meant by the carbon compounds? Contrast them with those of Inorganic Chemistry.
2. Explain what is meant by *saturated compounds*, *fractional distillation*. How is the latter applied in the manufacture of coal oil?
3. What compounds do the following symbols represent:—

$$C_2 H_4 O_2 \quad C_6 H_{10} O_5, \quad C O H_4 N_2, \quad C_5 H_7 N, \quad C_6 H_{12} O_6, \quad C_6 H_6 O.$$

From what sources are these compounds derived?
4. Name the organic acids occurring in the vegetable kingdom, and state in what plants they are found.
5. Into what divisions are the hydrocarbons usually arranged? Name six of the most important hydrocarbons and give the compounds derived from them.
6. State the changes which occur in *acetous fermentation*. What compound must be present before it can take place?
7. Define a fat, and illustrate by symbols the effect of an *alkali* upon it. Name the compound that results.
8. Name compounds formed by the substitution of the radical of nitric acid for three atoms hydrogen and give the properties of one.
9. Name the principal organic compounds formed in wheat, barley, potatoes, apples, lemons, grapes and wood.
10. Give notes on Opium, Urea, Chloroform and Morphine.

FIRST YEAR.

GEOLOGY AND PHYSICAL GEOGRAPHY.

Examiner: J. Hoyes Panton, M.A.

1. Distinguish between aqueous and metamorphic rocks, and state some of the inferences which can be drawn from the presence of aqueous rocks in a district.

2. Name the ages into which rocks are divided, and give the periods of at least two. What periods are known as Age of Mollusks, Age of Reptiles, Age of Mammals, Age of Cycads, and Age of Cryptogams?

3. Name formations in Canada from which the following economic materials are obtained:—building stone, lead, graphite, gypsum, salt, petroleum, lime, apatite and iron.

4. Describe a *crinoid*, *trilobite*, *belemnite*, and an *ammonite*. Name rocks in which these occur.

5. Explain how rocks are formed, and state the changes which they undergo after deposition. Name the different kinds of valleys, and distinguish them from each other.

6. How do you account for the absence of whole formations in some places?

7. What is meant by a *glacier*? How is it formed? How may it affect the physical features of a place?

8. How does the presence of a lofty range of mountains affect the climate of a country? Name the currents of the ocean, and the places where they occur.

9. Classify lakes, and give a diagram illustrating the relative positions of the Canadian lakes with reference to the level of the sea.

10. Identify the fossils before you.

FIRST YEAR.

STRUCTURAL BOTANY.

Examiner: James Mills.

1. Describe the structure of the cell, and its mode of reproduction.
   (*a*) Distinguish *vascular tissue* from the other kinds of vegetable tissue and explain its formation.

2. Write explanatory notes on *axillary buds*, *aerial roots*, *root stocks*, *air-plants*, *parasitic plants*, *stolons*, *tubers*.

3. What is the ordinary potato—a root or branch? Give reasons for answer.

4. Distinguish procumbent, decumbent, and creeping stems; exogenous and endogenous plants.

5. Describe the different parts of a flower, and explain what is meant by *staminate*, *pistillate* and *dioecious* flowers.

6. Give the common classification of fruits, and state what is meant by the terms *angiospermous*, *phænogamous*, and *dehiscent*.

7. Explain how plants grow, and give their most important chemical constituents.
   (*a*) Tell what you know about the functions of *chlorophyll*.

8. Describe the following processes:
   (*a*) Hybridization.
   (*b*) Layering.
   (*c*) Grafting and budding.

FIRST YEAR.

NATURAL HISTORY.

Examiner: James Mills, M.A.

1. What is the relation of organization to life? Enumerate the chief characteristics which distinguish animals from plants.
   (*a*) Name the sub-kingdoms, and describe any one of them.

2. Give a brief description of the two great sections of the animal kingdom—*Vertebrata* and *Invertebrata*.

3. What is taken as the basis of classification in Zoology? Describe and illustrate the meaning of the terms, *species*, *variety* and *race*.

4. Name the sub-kingdoms and classes to which the following belong:—jelly-fishes, corals, tape-worms, the lobster, spider, grasshopper, housefly, oyster, trout, ox and dog.

5. Describe the different stages in the life of an insect, and compare them with somewhat similar changes in another class.

6. Write as full notes as you can on the tape-worm, the bee, and the silk-moth.

7. Give the classes of Vertebrates; and the orders of Birds and Mammals, with at least one example of each.

8. Tell what you know about the *Ungulata* and the *Carnivora*.

FIRST YEAR.

VETERINARY ANATOMY AND PHYSIOLOGY.

Examiner: E. A. A. Grange, V.S.

1. Name the different processes of digestion, and the organs concerned in performing each process.
2. Describe the difference between the digestive organs of the horse and ox, taking the horse as the standard.
3. Name the organs which carry on the circulation of the blood.
4. Name the compartments the heart is divided into.
5. What kind of muscular tissue is the heart composed of?
6. Name the layers and glands entering into the formation of the skin.
7. Name the organs which compose the nervous system.
8. Name the three classes nerves are divided into.
9. Name the twelve pairs of cranial nerves, their function and distribution.
10. Describe the circulation of the blood through the heart and lungs.
11. What change takes place in the blood in the lungs?
12. Describe the mode in which the chyle passes into the blood.
13. Describe the organs of respiration.
14. Describe the urinary organs.
15. Describe the difference between the urethra of the ox and horse.

FIRST YEAR.

VETERINARY MATERIA MEDICA.

Examiner: E. A. A. Grange, V.S.

1. What is Materia Medica?
2. Mention the circumstances which modify the actions of medicines.
3. Mention the four classes medicines are divided into, and give an example of each class.
4. Give a definition for each of the following terms, viz: Antispasmodic, Tonic, Diaphoretic, Sedative, Vesicant.
5. Mention three medicines which act as Diuretics.
6. Mention three medicines which act as Disinfectants.
7. Name the actions and doses for the horse, ox, sheep, and pig, of Aconite.
8. Name the actions and doses for the horse, ox, sheep, and pig, of Arsenic.
9. Name the actions and doses for the horse, ox, sheep, and pig, of Carbolic Acid.
10. Name the actions and doses for the horse, ox, sheep, and pig, of Castor Oil.

FIRST YEAR.

COMPOSITION.

Examiner: James Mills, M.A.

1. Write explanatory notes on the meaning of the terms, *sentence*, *clause*, and *paragraph*.

2. "In determining the laws of style, we must be guided by usage"——Explain fully what is meant.

3. Enumerate what you consider the essential properties of a good style.

4. Describe and distinguish the Simple and the Elegant Style of writing.

5. What do Purity and Perspicuity prescribe? Name the corresponding errors under each head.

6. Write a composition on one of the following subjects:—

(*a*) Farming.

(*b*) "————just experience tells, in every soil,
That those who think must govern those that toil."

(*c*) "Full many a gem, of purest ray serene,
The dark unfathomed caves of ocean bear;
Full many a flower is born to blush unseen,
And waste its sweetness on the desert air."

FIRST YEAR.

ENGLISH LITERATURE.

Examiner: James Mills, M.A.

1.—(1) "Some village Hampden, that with dauntless breast
The little tyrant of his fields withstood;
Some mute inglorious Milton here may rest,
Some Cromwell, guiltless of his country's blood.

"The applause of listening senates to command,
The threats of pain and ruin to despise,
To scatter plenty o'er a smiling land,
And read their history in a nation's eyes,

"Their lot forbade."

(2) "Remote, unfriended, melancholy, slow,
Or by the lazy Scheldt, or wandering Po;
Or onward, where the rude Carinthian boor
Against the houseless stranger shuts the door;
Or where Campania's plain forsaken lies,
A weary waste expanding to the skies;
Where'er I roam, whatever realms to see,
My heart untravelled fondly turns to thee."

(3) "Pride in their port, defiance in their eye,
I see the lords of human kind pass by,
Intent on high designs, a thoughtful band,
Fierce in their native hardiness of soul,
True to imagined right, above control."

(*a*) Explain the meaning and the allusions in the first four lines of the first extract.

(*b*) Change the last five lines of the first extract into prose.

(*c*) Parse the word *slow*, and write notes on the geographical allusions in the second extract.

(*d*) Paraphrase the last extract, and parse the words *pride* and *above*.

2. Pride in their port"—What is the meaning of the word port? Give other meanings, and account for them etymologically.

3. Derive the words *melancholy*, *boor*, *molest*, *wanton*, *hamlet*, *debauch*, *coward* and *shrine*.

4. Quote from the "Elegy" or "Traveller," two examples of *Metaphor*, *Simile*, *Oxymoron*, *Onomatopœia*, and *Hypallage*.

5. "Her useful sons exchanged for useless ore."
"Laws grind the poor, and rich men rule the law"
"And talent sinks, and merit weeps unknown."
"By forms unfashioned, fresh from Nature's hand."
Comment on each of these lines.

6. Compare Italy and the Italians with Switzerland and the Swiss, according to Goldsmith. Point out anything which you think incorrect or unjust in his description.

7. Write a note on the metre of the "Traveller," and scan the last two lines of the second extract.

(*a*) Quote examples of *assonance* and *alliteration*.

8. Compare the styles of Gray and Goldsmith; and write a short life of each.

FIRST YEAR.

ARITHMETIC.

Examiner: A. A. Mactavish.

1. A farmer had a field of corn, consisting of 129 rows, and each row contained 95 hills, and each hill had on an average 5 ears of corn; if it takes 8 ears of corn to make a quart, what is the produce of the field worth at 50 cts. per bushel?

2. *A* and *B* lend each $248 for 3 years at 3½ per cent.—one at simple and the other at compound interest. Find the difference of the amount of interest which they respectively receive.

3. Wm. Henry Warden

Bought of Smith, Jones & Co.

1879.	Jan. 15,	Mdse. on credit at	6 months,	$400
	June 25,	" "	4 months,	$150
	July 5,	" "	3 months,	$300
	Aug. 10,	" for cash		$100

When did the preceding account become due?

4. What will be the premium of insurance on buildings valued at $3,000 @ ⅜ per cent.?

5. A Board of Trustees borrowed $3,000, and agreed to pay it in 10 equal annual instalments. Determine the amount of each instalment, money being worth 10 per cent.

6. If 14 men can mow 35 acres of grass in 6 days of 10 hours each, in how many days of 12 hours each can three men mow 24 acres?

7. A person having $9,790 in the Toronto city 6 per cent. bonds, sells out at 98¼, and invests the proceeds in Bank of Montreal stock at 177½, which pays a dividend of 12 per cent. per annum; find the change in his income, brokerage in each transaction being ¼ per cent.

8. Barley, at 45c, is mixed with peas, at 55c per bushel, in the ratio of one of the former to two of the latter. What is a bushel of the mixture worth?

9. A merchant in Guelph wishes to remit $2,767.80 to Manchester, England, exchange being at 108; what will be the face of his bill in pounds, shillings, and pence?

10. Extract the square root of 1550025, also the cube root of 14641, and determine the value, true to two places of decimals, of $(1.1)^{20}$.

11. In a constituency in which each elector may vote for two candidates, half of the constituency vote for *A*, but divide their votes between *B*, *C*, *D*, and *E* in the proportions of 4, 3, 2, 1; of the remainder, half vote for *B*, and divide their votes among *C*, *D*, *E* in the proportions of 3, 1, 1,; ⅔ of the remainder vote for *D* and *E*, and 540 do not vote at all. Find the order on the poll, and the whole number of electors.

FIRST YEAR.

MENSURATION.

Examiner: A. A. Macтavish.

1. How many square chains in the following:—

(*a*) An equilateral triangle whose base is 13 chains.
(*b*) A square whose side is 13 chains.
(*c*) A circle whose radius is 13 chains.

2. What fraction of a sphere must be cut away to reduce it to the largest possible cube?

3. How many cords of wood in a pile 64 feet long, 8 feet wide, and 6 feet high?

4. How far must a team of horses travel in cutting an acre of wheat—length of knife being 5 feet?

5. Which will carry off the greatest amount of water, one tile 6 inches diameter, or three 3 inches in diameter?

6. How many bushels (Imperial) will a bin, 12 feet long, 6 feet wide, and 5 deep, hold?

7. Neal Thorp's barn is 60 feet long, 48 feet wide, and 16 feet high, ridge 12 feet, having one driving floor 12 feet wide. Find

(*a*) The storage capacity.
(*b*) The length of rafter (1 foot over plate).
(*c*) The number of bunches of shingles necessary to cover roof (carpenter's rule).

8. Find the cost of building a sidewalk from the farm to the city limits, a distance of one half mile—walk made of two-inch plank, to be 4 feet wide, and resting on two sills (4 in. x 4 in.) running lengthwise—cost of lumber, $10 per M.

9. A farmer's experimental field is in the form of a rectangle 16 rods long, and contains two acres. It is divided into plots, thus:—

$\frac{3}{4}$ acres are set apart for wheat (three varieties).
$\frac{1}{4}$ acre is set apart for oats (two varieties).
$\frac{3}{8}$ acres are set apart for grasses (three varieties).
The rest of the field is set apart to solve the question, "Can permanent pastures be had in Ontario?"

Determine the width of these four plots.

1. Supposing them to lie across the field.
2. " " lie along "

FIRST YEAR.

BOOK-KEEPING.

Examiner: A. A. Macтavish.

1. Write an accepted time draft; a joint note; a receipt.

2. What are the conditions under which a personal account shows an asset?

3. A father bequeaths to his son 100 acres of good land—well drained, well fenced, and provided with the necessary buildings; also $1,500 in money. Show what you think to be the most judicious manner of using this money.

4. Bought of Henry Worden, a team of horses for $300. Paid cash $200, and gave my note at three months for balance. Write such a note, and show what ledger accounts are affected, and in what manner, by the above transactions.

5. What are the two most important points to be kept in view in framing an advertisement? A heifer has strayed from your premises. Give the form of advertisement for her recovery.

6. 1878—May 1st.—One day's labour—ploughing and harrowing potato field at $2.00 per day.

May 2nd. Bought 12 bushels of potatoes for seed at 37½c. per bushel; also paid for two days' labour planting the field at $1.00 per day.

June 20th.—One day's labour ploughing, $1.50; also two days' labour, hoeing at $1.00 per day.

July 7th.—One day's labour, ploughing, $1.50.

September 15th.—Digging and covering potatoes $5.00; also, sold 12 bushels of potatoes for cash at 25c. per bushel, and 25 bushels small potatoes at 20c. per bushel.

1879—March 17th.—Paid for 3 days' labour, marketing, at $2.00 per day; also received cash for 300 bushels of potatoes at 35c. per bushel.

Determine profits from the above potato field.

SECOND YEAR.

AGRICULTURE—THE FIELD.

(First Paper).

Examiner: W. Brown.

1. Divide a farm of a 100 acres into suitable fields for a seven course rotation in mixed husbandry, and show the annual produce, in quantity and value, on an average of seasons, under good management, in Ontario.

2. Criticize the conduct of mineral superphosphate, gypsum, and bone dust, in our experience, upon roots and grain during the last two years.

3. State what is the proper position of the growing of green fodders in connection with "soiling," and estimate results on a hundred-acre farm in this country.

4. Give your opinion upon the present and the future of pastures in Ontario.

5. Were you in possession of what is called an exhausted farm (clay loam), by what means would you most rapidly and thoroughly restore its fertility?

SECOND YEAR.

AGRICULTURE.

(Second Paper).

Examiner: W. Brown.

1. Last season The Ontario Experimental Farm produced 3,598 bushels of grain, of kinds; 203 tons straw; 234 tons hay, and 20,684 bushels roots, of sorts. Approximate the quantity of beef these would make during six months of winter.

2. Make a close estimate of the cost of the crop of spring wheat, from field 14, showing every detail item up to the bagging for market.

3. Draft ground plan of dwelling house for an average farmer, giving sizes of parts.

4. Sketch a section of levelling for the proposed drainage of field 14, showing undulations of surface, distances, cuttings, intersections, and estimate the cost of completing the drain with four inch tiles.

5. It is proposed to alter the cropping of the O. E. Farm to a more exhaustive one. Say how this should be gradually brought about, and justify it upon scientific and practical facts.

SECOND YEAR.

AGRICULTURE: LIVE STOCK.

Examiner: W. Brown.

1. Sketch briefly the management of a ewe flock from 1st September to 1st July.
2. Give details of the duties of a shepherd during the lambing season.
3. Specify all particulars in regard to the time, management, materials used, and the objects sought for in the dipping of sheep.
4. Explain all the *reasons* by which we were guided in the selection and purchase of our Shorthorn Bull, "*Prince Hopewell.*"
5. Make a statement showing the various items that go to make up the actual cost of a yearling bull, without reference to profit.
6. Give an example of the purchase, feeding, management, progress, and financial results of a steer during six months of winter and spring.

SECOND YEAR.

AGRICULTURE: PRACTICAL EXAMINATION ON LIVE STOCK.

Examiner: W. Brown.

Cattle.

Subjects to be examined: Shorthorn Steer; Galloway Steer; Grade Cow.

1. Describe the Shorthorn with reference to five most important qualities for fattening purposes.
2. Point out the four greatest defects in the same animal.
3. Handle and describe the weakest point and the best point of the frame of the Galloway for carrying beef.
4. Judge and decide upon the relative merits of the two steers as regards quality and evenness of flesh.
5. Show the five best indications in this cow as a milker.

Sheep.

Subjects to be examined: Leicester Ram; Cotswold Ram; Southdown Ram (1); Southdown Ram (2); Oxford Down Grade Wether.

1. Show wherein one Southdown is superior to the other.
2. Which is the oldest and the youngest sheep of the lot?
3. Judge the Oxford Grade Wether, and compare him with the Leicester standard of points.
4. Explain the principal points of difference between the frame of the Cotswold and that of the Leicester.
5. Which is the best wooled sheep of the lot, as regards uniformity and lustre.

SECOND YEAR.

ARBORICULTURE.

Examiner: W. Brown.

1. What are the four main objects in the maintenance of trees in a country?
2. What kind of trees are best adapted for replanting in Ontario?
3. How would you attend to the selection, removal, preparation of the ground, planting, and subsequent management of a clump of trees?
4. Detail the cost of planting one acre, seven feet apart, by trees from our own bush.
5. Give your opinion on the whole question of replanting in this country.

SECOND YEAR.

AGRICULTURAL CHEMISTRY.

Examiner: J. Hoyes Panton, M.A.

1. Name the constituents present in the food of animals. Which of these go to the formation of *fat, bone, muscle?* Contrast the comparative amount of these ingredients in magnolds, barley, pease, linseed cake and lucerne.

2. Where and by what reagents are the following changes in the digestion of food effected? Starch converted into sugar, albuminous compounds rendered soluble, fats broken up, and fibrinous substances dissolved.

3. Name the proximate principles and ultimate elements in plants, and mention plants in which some of the former predominate.

4. What chemical compounds are characteristic of the grasses, roots, and grains? —Contrast sand, clay and loam as affording food for plants.

5. What changes does carbon undergo in plants after its abstraction from the atmosphere, and by what means are these effected?

6. From what sources have the alumina, potash, soda, silica, phosphoric acid and lime of Canadian soils been derived?

7. Give causes for unproductiveness in soils; the means by which they can be detected and overcome.

8. What is tri-calcic phosphate? Show the reaction which takes place on the addition of acids, and name the sources from which this mineral can be obtained.

9. Name the *double silicates* in soils. What compound has a beneficial effect in their decomposition? Show how this takes place.

SECOND YEAR.

ANALYTICAL AND PRACTICAL CHEMISTRY.

Examiner: J. Hoyes Panton, M.A.

1. Give an outline of the different steps followed in ascertaining the base which enters into the composition of the salt under examination.

2. Gypsum in a ground form sometimes contains crystalline limestone in a finely divided condition. How would you detect this? Give the composition of gypsum.

3. Name the adulterations usually found in white lead, and state how you would detect them.

4. Outline the method pursued in testing a portion of linseed cake for impurities likely to be present when the cake is adulterated.

5. How would you make a quantitative analysis of soil for lime and organic matter? Give an example illustrating the calculations necessary to be made.

6. Give a qualitative analysis of each of the substances before you.

SECOND YEAR.

ECONOMIC BOTANY.

Examiner: J. Hoyes Panton, M.A.

1. Name the different points to be considered in making a natural classification of plants, and distinguish between Angiospermous and Gymnospermous plants.

2. Give the life-history of the common mushroom (*Agaricus campestris*), and contrast its structure with that of a fern.

3. What peculiarity occurs in the flowers of the pumpkin and Indian turnip? Name three others in which the same exists.

4. Give the characteristics of the orders *Umbelliferæ, Cruciferæ, Labiatæ, Cupuliferæ, Coniferæ.*

5. To what orders do the following plants belong :—mangold, squash, barley, bean, kale, carrot, parsley, spinage, sage and tomato?

6. Write notes on *Tilletia caries*, *Clariceps purpura* and *Podophyllum peltatum*.

7. Name ten plants used for economic purposes, and the orders to which they belong.

8. What peculiarity exists in the following fruits :—apple, pineapple, strawberry, pea, melon, pear, elm seed, currant and corn?

9. Give the distribution in *time* of the following plants ;—*Calamites*, *Lepidodendron*, *Cycads* and *Sigillaria*.

10. Identify the specimens before you.

SECOND YEAR.

ENTOMOLOGY.

Examiner: J. Hoyes Panton, M.A.

1. Describe what is called the *suctorial mouth* in insects, and give the orders in which it occurs.

2. Explain the terms, larva, imago, pupa, chrysalis, cocoon, grub, bug, and caterpillar, as applied to insects.

3. Name the different ways in which insects are injurious to vegetation, and give the orders to which the most injurious belong.

4. To what orders do the following insects belong ; canker worm, the borer, aphides, apple-tree pruner, fall web worm, midge, tomato worm, apple curculio, locust, potato bug, squash bug, and currant worm.

5. Give notes on *Anisopteryx vernata*, and mention the best remedies to prevent its increase.

6. Describe the larva of the forest tent caterpillar (*Clisiocampa sylvatica*), and give remedies for its destruction.

7. Contrast the apple curculio (*Anthonomus quadrigibbis*) with the plum curculio (*Conotrachelus nenuphar*).

8. Describe the imago of the pea-weevil (*Bruchus pisi*), and give remedies.

9. Give remedies to prevent the increase of the currant worm.

10. Identify the specimens before you, and name the plants affected by them.

SECOND YEAR.

METEOROLOGY.

Examiner: J. Hoyes Panton, M.A.

1. Describe the following meteorological instruments: Maximum thermometer, Barometer, and Anemometer.

2. Give notes on the reading of barometers, and the corrections sometimes necessary to be made. Expain how the barometer is of great use in foretelling the approach of storms.

3. Distinguish between convection and conduction of heat, and account for the more rapid increase in temperature of some soils as compared with others.

4. In the graduation of a thermometer, why is the boiling point made last? Distinguish between Fahrenheit and Centigrade thermometers. Reduce 42° F. to C., 16° C. to F., 24° C. to R.

5. What is meant by the "specific heat" of a substance? Compare the specific heat of mercury with that of water. What influence has the specific heat of water on climate?

6. Give the causes of *radiation fogs*, and state how they can be prevented.

7. Describe Daniell's Hygrometer. Find the dew-point from the following data: Dry bulb thermometer, 74°; Wet bulb thermometer, 65°.

8. What is the effect of moisture in the atmosphere? How is it ascertained? Describe the pluviameter.

9. Name the different kinds of clouds, and state the kind of weather likely to follow their appearance.

10. Account for the wonderful rainfall in parts of India, and also for the presence of deserts in different parts of the world.

SECOND YEAR.

PATHOLOGY—(HORSE).

Examiner: E. A. A. Grange, V.S.

1. Describe the nature, causes, symptoms, and treatment of Spasmodic colic.
2. " " " " Enteritis.
3. " " " " Catarrh.
4. " " " " Bronchitis.
5. " " " " Lymphangitis.
6. " " " " Nephritis.
7. Name the diseases of the skin.
8. Describe the causes, symptons, and terminations of Inflammation.
9. Describe the various modes for the treatment of Hernia.
10. Describe the operation of Lithotomy.

SECOND YEAR.

PATHOLOGY (CATTLE).

Examiner: E. A. A. Grange, V.S.

1. Describe the nature, causes, symptoms and treatment of Choking.
2. " " " " Tympanitis.
3. " " " " Mammitis.
4. " " " " Inpaction of the Rumen.
5. Describe the nature, causes, symptoms and treatment of contagious Pleuro-Pneumonia, and the best means of prevention.
6. Describe the nature, causes, symptoms and treatment of Scab in Sheep.
7. " " " " Foot-rot.
8. " " " " Sturdy.
9. " " " " Maggots or Fly.
10. " " " " Ticks in Sheep.

SECOND YEAR.

VETERINARY MATERIA MEDICA.

Examiner: E. A. A. Grange, V.S.

1. What classes are tonics divided into? Give an example of each class; state when and how they are used.

2. Mention the medicine which is most commonly used as a purgative for the horse, ox, sheep, pig and dog; and give the dose for each animal.

3. Name diseases in which diuretics should not be given.

4. Name diseases in which purgatives should not be given.

5. Mention the actions and doses for the horse, ox, sheep and pig, of Tincture of Opium.

6. Mention the actions and doses for the horse, ox, sheep and pig, of Sulphate of Magnesia.
7. Mention the actions and doses for the horse, ox, sheep and pig, of Nitrate of Potash.
8. Mention the actions and doses for the horse, ox, sheep and pig, of Sulphate of Zinc.
9. Mention the actions and doses for the horse, ox, sheep and pig, of Acetate of Lead.
10. Mention the actions and doses for the horse, ox, sheep and pig, of Oil of Turpentine.

SECOND YEAR.

COMPOSITION

Examiner: JAMES MILLS, M.A.

1. Enumerate what you consider the most important characteristics of good composition.
2. Explain and illustrate the difference between a "period" and a "loose sentence."
3. What is meant by style? What are the essential properties of a good style?
4. Distinguish the neat and the elegant style of writing.
5. What is comprised under the head of diction? Name and account for the most important differences between prose and poetic diction.
6. Write a composition on one of the following subjects:

(*a*) "————————————————'tis meet
That noble-minds keep ever with their likes;
For who so firm that cannot be seduced."

(*b*) "————lowliness is young ambition's ladder,
Whereunto the climber upward turns his face;
But when he once attains the utmost round,
He then unto the ladder turns his back,
Looks in the clouds, scorning the base degrees
By which he did ascend."

(*c*) Canada.

SECOND YEAR.

SHAKSPEARE'S "JULIUS CÆSAR."

Examiner: JAMES MILLS, M.A.

1. When was this tragedy written? Criticise the name.
2. Give in chronological order the most noted events which occurred during the period over which the action of the play extends—from February 44 B. C. to autumn, 42 B. C.
3. Which is the best drawn character in the play, and why?
4. Compare the following:—
   (1) Shakspeare's character of Julius Cæsar with that given in Roman history.
   (2) Brutus and Cassius.
   (3) The speeches of Brutus and Antony after the assassination.
5. "The quarrel between Brutus and Cassius is managed in a masterly way"—Show this by quotations and comments.
6. Sketch the character of Portia.
7. Write a short article on the Elizabethan period of English literature.

8. "I,—as Æneas, our great ancestor,
Did from the flames of Troy upon his shoulder
The old Anchises bear,—so from the waves of Tiber
Did I the tired Cæsar."
Explain the simile; point out any irregularity in the syntax: accent the word *ancestor* according to the requirements of the metre; scan the Alexandrine line and account for its use in this passage.

9. Explain and illustrate Shakspeare's use of the words *an, given, envious, factious* and *favour.*

10. (*a*) "The quarrel will bear no colour for the thing he is."
(*b*) "The genius and the mortal instruments are then in council."
(*c*) "The insuppressive metal of our spirits."
(*d*) "Cæsar, I never stood on ceremonies."
(*e*) "Set a huge mountain between my heart and tongue."
(*f*) "You yourself are much condemned to have an itching palm."
Explain the connection and meaning of each of these extracts.

11. Derive the words *blaze, rheumy* and *brooked.*

12. "You have ungently stole from my bed"; "that have spoke the word"—Point out peculiarities in syntax, and account for Shakspeare's use of such forms.

13. Quote some of the best passages in the play.

SECOND YEAR.

POLITICAL ECONOMY.

Examiner: James Mills, M.A.

1. Explain what you mean by Political Economy. Give the divisions of the subject.

2. Define Wealth and Utility, giving suitable illustrations.

3. What are the requisites of Production? Distinguish and illustrate.

(*a*) Enumerate the advantages and disadvantages of the Division of Labour.

4. State and defend your views on—

(1) Free Trade generally.
(2) Free Trade in Canada.

5. Give reasons why every person should save something when possible.

6. Is any Government justified in forcing—

(*a*) A farmer to sell a railway company the right of way?
(*b*) The wealthy landlords of Ireland to sell a portion their land to the tenants?

Answers must be supported by reasons.

7. Discuss—

(1) The Distribution of Wealth.
(2) Paper Currency, including the "Rag Baby" question.
(3) Credit Cycles.
(4) Functions of Government.

SECOND YEAR.

NATURAL PHILOSOPHY.

Examiner: A. A. Macdonell.

1. Define force, and show how it is measured.

2. What is meant by work? What is its unit of measurement? How many units of work are expended in ploughing an acre of land—draught of plough 414 lbs., width of furrow 8½ inches?

3. Enunciate the principle of "Virtual Velocity," and apply it to find the relation between the power and weight in a system of pulleys where each movable pulley hangs by a separate cord.

4. A grocer uses a false pair of balances in which the beams are $9\frac{1}{2}$ and $9\frac{1}{4}$ inches respectively. A customer has bought what seemed 20 lbs. of tea; how much did he really get, the tea having been weighed in the pan of the longer beam?

5. What force must a team exert to draw a load of one ton up an incline (macadamized road) rising 1 in 50, friction estimated at one-thirty?

6. In railway curves, one side of the track is higher than the other. Which side is the higher, and why?

7. A rope-walker is about to fall to the right. Which way will he shift his pole to regain his equilibrium, and why?

8. A pebble is dropped into a very deep well; it strikes against one of the sides. Which side does it strike, and why?

9. A beam weighing 200 lbs. is carried by two men, one being at a distance of three feet from the centre of gravity of the beam, and the other at a distance of two feet. Find the weight borne by each man.

10. Tell what you know of the action of the suction pump.

SECOND YEAR.

SURVEYING AND LEVELLING.

Examiner: A. A. Mactavish.

1. Plan and find the area of field from the following notes—

L. Offsets.	Chain Line.	R. Offsets.
	To O B	
	460	
i	410	55, K
g	180	50, H
	O A	
	To O A	
	325	
q	210	25, R
p	65	30, S
	O D	
	To O C	
	450	
n	430	155, B
D, 180	291	P
Begin at	O A	range S. W.

Scale—64 links to an inch.

2. In a hundred-acre farm, whose length is 160 rods, it is required to make a field of 20 acres, similar to it; find its length and breadth.

3. The following is a running level from station A to station B—

Back Sight.	Fore Sight.	
4.23	3.15	Peg 1, distance 100 feet.
1.66	2.48	" 2, " 100 feet.
3.09	4.89	" 3, " 100 feet.
2.47	1.25	" 4, " 100 feet.
7.21	3.45	" 5, " 100 feet.
6.24	9.03	B 78 feet.

Complete the field book.

4. Show how to measure the distance across a wide river.
5. Show how to test the accuracy of a cross-staff.

NOTE.—In addition to the above, candidates will be examined as to their ability in handling instruments for levelling and surveying.

SECOND YEAR.

BOOK-KEEPING.

Examiner: A. A. MACTAVISH.

1. Enumerate the ledger accounts requisite in the business of an average farmer in Ontario.
2. Give an example of a completed imaginary ledger account with a wheat field of twenty acres.
3. Give an inventory, with values of stock and implements, for a farm of 100 acres.
4. Bought on 1st December, 1878, sixteen head of cattle, mostly Durham Grades, fourteen of which were two and a half year old steers, and two three-year old heifers. Paid 3½c. per pound—Total weight being 17.528 pounds. The food consumed and the cost for five months were as follows:

Swede Turnips ...	162,480 lbs. @ 8c. per 60 lbs.
Mangolds	54,480 lbs. @ 10c. per 60 lbs.
Pea Meal	12,960 lbs. @ 1c. per 1 lb.
Corn Meal	10,448 lbs. @ 45c. per 56 lbs.
Fodder	24,000 lbs. @ $4 per 2000 lbs.
The cost of attendance	$52 50
The cost of bedding	15 00

At the end of five months the animals weighed 22,122 pounds, and were disposed of at 5½c. per pound. The commercial value of the manure was estimated at $269.

Determine financial results from the above experiment, by posting into ledger in proper technical form and language.

5. Write (1) a "joint and several note."
(2) a non-negotiable note.

II. PAPERS SET AT THE SESSIONAL EXAMINATIONS—JUNE, 1880.

FIRST YEAR.

AGRICULTURE.

Examiner: W. BROWN.

1. Give a full description of the accompanying sample of wheat.
2. What are the best conditions for the germination of seeds?
3. Give a concise sketch of the best method of preserving farm-yard manure.
4. Name our principal special fertilizers, and say to what crops they are particularly suitable.
5. Give a general idea of the management of cereal crops.
6. What is the usual mode of cultivating root crops?
7. What are our principal green fodders, and at what time of the year are they usually available?
8. Give a full description of the orchard and rye grasses, and of alsike and lucerne clovers.
9. Classify the various kinds of wheat, barley and mangolds.
10. Indicate briefly the management and importance of permanent pastures.

FIRST YEAR.

GEOLOGY AND PHYSICAL GEOGRAPHY.

Examiner: J. Hoyes Panton, M.A.

1. Give the characteristics of metamorphic rocks. Name some of the most important minerals found in them, and state where these rocks occur.
2. Give reasons for inferring that granite has once been in a molten condition, and cooled slowly under great pressure.
3. Name examples of chemically formed rocks, and mention formations in which large deposits of them occur.
4. Explain the terms tilting, dip, fault, denudation, stalactite, unconformability.
5. What fossils predominate in the following periods:—Silurian, Devonian, Carboniferous, Jurassic and Post-pliocene?
6. Describe what is known as the Erie and Huron geological district.
   (*a*) Name the different formations which occur in it.
   (*b*) Give its economic deposits and the formations in which they are found.
   (*c*) State the general composition of the soil.
7. In what formations do graptolites and trilobites disappear?
8. Identify the fossils before you.
9. What causes the trade winds, and where do they occur? Classify regional winds.
10. Give the characteristics of the North Atlantic Ocean. In what locality is it deepest?
11. Describe fully the equatorial current with reference to cause, locality and direction.

FIRST YEAR.

STRUCTURAL AND PHYSIOLOGICAL BOTANY.

Examiner: J. Hoyes Panton, M.A.

1. Name the parts of a plant which appear during the early stages of its growth, and state by what means you can know the class to which the plant belongs.
2. What peculiarity is observed in the growth of biennial plants during the first year?
3. Draw diagrams illustrating five different forms of inflorescence, and the difference in structure between an exogenous and endogenous stem.
4. Explain the terms, plumule, tuber, bulb, stolon, axil, key, monœcious, deciduous, epiphyte, legume as applied to plants.
5. Contrast the parts of an endogenous plant, with those of an exogenous.
6. Distinguish between a prickle and thorn and illustrate by examples.
7. Classify leaves with reference to position, outline, venation and margin.
8. Name the parts of a flower, and state the function each performs in the reproduction of the plant. Give examples of what are termed monœcious and diœcious plants.
9. What peculiarity exists in the fruit of the apple, rose, strawberry, pineapple and pear?

FIRST YEAR.

MATERIA MEDICA.

Examiner: E. A. A. Grange, V.S.

1. Give a definition for Materia Medica.
2. Name the various circumstances which modify the action of medicines, and describe how each circumstance modifies the action of the medicine.
3. Give a definition for each of the following terms, viz: Hœmatic, Neurotic, Eliminative, Astringent.

4. Describe the actions, uses, and doses, for the domestic animals, of Aloes.
5. " " " " " " " " Tinct. of Aconite.
6. " " " " " " " " Extract of Belladonna.
7. " " " " " " " " Linseed Oil.
8. " " " " " " " " Cantharides.
9. " " " " " " " " Cinchona.
10. " " " " " " " " Sulphate of Iron.

FIRST YEAR.

ENGLISH LITERATURE.

The Lady of the Lake.

Examiner: James Mills, M.A.

1. Describe the Spencerian stanza.
2. Write a composition giving a synopsis of the first canto.
3. What historical person does Scott intend to pourtray in Fitz-James?
4. Give a short history of the Douglas family.
5. "State your views as to the points of difference between the men of the 'Lady of the Lake' and the actual men of the period which Scott intended to describe."
6. Quote or refer to passages which illustrate Scott's narrative, descriptive, and lyrical powers.

7. "I little thought when first thy rein
I slacked upon the banks of Seine,"
etc., etc.

(*a*) Explain the allusion.
(*b*) Complete the quotation.

8. Explain the terms, *idiom*, *alliteration*, *rhythm*, *onomatopœia*, and *paragoge*.
9. Derive *quarry*, *bulwark*, *bugle*, *canopy*, *falchion*, *weird*, and *stalwart*.
10. Write notes on *Knight-errantry*, *Fine-man*, and *Clan-Alpine*.
11. *Frontlet*—Give as many examples as you can of other diminutive endings used in English.
12. Explain the meaning of *linn*, *dingle*, *ken*, *whinyard*, *cupola*, *snood*, *brook*, and *pibroch*.
13. Draw an outline map of Scotland or a portion of it, marking the position of *Katrine*, *Achray*, *Vennachar*, *Lomond*, *Trossachs*, *Benvenue*, *Forth*, and *Teith*.

14. (*a*) "Huntsman, rest! thy chase is done,
While our slumberous spells assail ye,
Dream not with the rising sun,
Bugles here shall sound reveillé."

(*b*) 4. "Row, vassals, row, for the pride of the Highlands!
Stretch to your oars for the ever-green pine.
O! that the rosebud that graces yon islands
Were wreathed in a garland around him to twine."

(1) Scan these passages, giving the names of the metres.
(2) What is peculiar in the use of "ye"?
(3) Explain the allusions in the "ever-green pine" and "the rose-bud."

16. Name Sir Walter Scott's most noted contemporaries, and write a short article on the literature of his time.

FIRST YEAR.

MENSURATION.

Examiner: A. McTavish.

1. Define circle, sphere, trapezoid, heptagon, square.
2. How many square feet in a rectangle whose sides are 15 and 20 yards respectively?
3. Find the area of a square field whose diagonal is 40 chains.
4. Find the area of the equilaterial triangle inscribed in a circle whose diameter is 12 feet.
5. How many bunches of shingles will be required to cover a barn roof; length of roof 75 feet, length of rafter 25 feet?
6. How far must a team of horses travel in ploughing a field of one acre—width of furrow 8 inches?
7. How many cubic yards in a frustum whose dimensions are as follows: length of the lower edge 40 feet, length of upper edge 30 feet, height of frustum 5 feet?
8. Find the solid contents of a cone whose base has a diameter of 10 feet and height 12 feet.
9. How many cubic feet must be excavated in digging a cellar 40 feet long, 30 wide and 8 deep?
10. How many gallons of water will a cistern whose diameter is 12 feet and depth 16 feet hold?

SECOND YEAR.

AGRICULTURE.

Examiner: W. Brown.

1. What was the nature and general result of our past winter's cattle-feeding experiment.?
2. Give in full the reasons by which we selected cows for experiment in grazing *versus* soiling this season.
3. Sketch the arrangement and general management of our farm this season, in regard to hay and pastures.
4. Take our farm as one to compete for the Medal of the Agriculture and Arts Association, and report upon its merits according to the accompanying points:

		Full Value.
(1)	Nature of farming suitable to circumstances	50
(2)	Proper portion of bush and permanent pasture	50
(3)	Position and character of buildings in relation to farm	100
(4)	Attention to preservation of timber and tree planting	50
(5)	Condition of private roads and fences	50
(6)	Improvements by removal of obstacles to cultivation, including drainage	100
(7)	Management, character, suitability, condition, and number of live stock kept	150
(8)	Number, condition, and suitability of implements and machinery	50
(9)	Management of farm-yard manure	50
(10)	Cultivation of crops, embracing manure, cleaning, produce per acre in relation to management, and character of soil and climate	100
(11)	General order, economy and water supply	100
(12)	Cost of production, and relative profits	150
		1000

SECOND YEAR.

PRACTICAL AND ANALYTICAL CHEMISTRY.

Examiner: J. Hoyes Panton, M. A.,

1. Describe fully the preparation of hydric sulphide and ammonic sulphide.
2. Give the tests for lime, silver, iron and copper.
3. Find the specific gravity, the percentage of organic matter, and the moisture in the soil given you for analysis.
4. How can you distinguish mica, gold, copper pyrites, and iron pyrites from each other?
5. Detect the adulterations present in the samples before you.
6. Analyze, and give the composition of the compounds marked 1, 2, 3, 4, 5.

SECOND YEAR.

SYSTEMATIC AND ECONOMIC BOTANY.

Examiner: J. Hoyes Panton, M.A.

1. Name the characters usually considered in making a natural classification of plants. Classify the cryptogams.
2. To what orders do the following belong: lucerne, blue weed, thistle, daisy, beet, onion, cedar, Indian turnip, rhubarb?
3. Give examples of cryptogamous plants which are of economic value, and name the classes to which they belong.
4. Name the orders of which the following are the characters:

   (*a*) Irregular corolla (papilionaceous), leaves alternate, five irregular petals, exogenous stem.

   (*b*) Herbs with square stems and opposite leaves, irregular two-lipped corolla, 4 stamens, 2 long, 2 short, leaves dotted with small glands, which contain a volatile oil.

5. Contrast *Trifolium repens* with *T. pratense.*
6. Give the characters of the orders, *coniferæ*, and *gramineæ.* Name two genera in each.
7. Describe the flower of the Indian turnip, and of the Begonia.
8. Analyze the flowers before you. Give the name and order to which each belongs.

SECOND YEAR.

MATERIA MEDICA.

Examiner: E. A. A. Grange, V.S.

1. Describe the actions, uses and doses for the domestic animals of Sulphate of Magnesia.
2. " " " " " " Opium.
3. " " " " " " Nux Vomica.
4. " " " " " " Calomel.
5. " " " " " " Croton Oil.
6. " " " " " " Nitrate of Potash.
7. " " " " " " Water.
8. " " " " " " Nitrate of Silver.
9. " " " " " " Linseed Oil.
10. " " " " " " Acetate of Lead.

SECOND YEAR.

ENGLISH LITERATURE: MACBETH.

Examiner: James Mills, M.A.

1. Enumerate the influences which caused the outburst of literary activity in England during the latter part of Queen Elizabeth's reign, and write a short composition on the literature of the period.

2. Comment on *Macbeth*, and name another play into which Shakespeare introduces "a supernatural element."

3. "Did Shakespeare intend to depict Macbeth as naturally prone to be the subject of illusions with regard to supernatural appearances; or as having been brought into such a state of mind that he was disposed to become the subject of such illusions; or did he intend to represent the various appearances as real? Discuss the question fully."

4. Explain the meaning of the following, point out the peculiarities, and notice different readings:

(1) "There's daggers in men's smiles; the near in blood
The nearer bloody."
(2) "Ere human statute purged the gentle weal."
(3) "If trembling I inhabit then, protest me
The baby of a girl."
(4) "The apparition of a bloody child arises."
(5) "And some I see
That two-fold balls and treble sceptres carry."
(6) "This push
Will chair me ever or unseat me now."
(7) "Boundless intemperance
In nature is a tyranny."
(8) "Now minutely revolts upbraid his faith-breach."

5. Quote examples of *metaphor*, *simile*, and *hypallage* from Macbeth.

6. Write geographical notes on Forres, Cawdor, Glamis, Scone, Dunsinane and Colmes-kill.

7. Derive *caldron*, *foisons*, *surcease*, *chalice*, *vizards*, *plague*.

8. Sketch the character of Lady Macbeth.

9. "There is an entire absence of comedy, nay, even of irony and philosophic contemplation in *Macbeth*."—*Coleridge*.

Quote a passage to prove that this statement is incorrect.

10. "If it were done when 'tis done then 'twere well
It were done quickly if the assassination
Could trammel up the consequence and catch
With his surcease success that but this blow
Might be the be-all and the end-all here
But here upon this bank and shoal of time
We'd jump the life to come but in these cases
We still have judgment here that we but teach
Bloody instructions which being taught return
To plague the inventor this even-handed justice.
Commends the ingredients of our poison'd chalice
To our own lips."

(*a*) Punctuate this passage.

(*b*) Write a paraphrase of the passage, showing clearly what you conceive to be the meaning.

(*c*) Explain particularly the expressions "bank and shoal of time" and "jump the life to come."

11. Quote what you consider the finest passages in the play.

SECOND YEAR.

NATURAL PHILOSOPHY.

Examiner: A. A. Mactavish.

1. Define force. Give three examples.
2. Define acceleration, and tell what is meant by saying that $g=32$.
3. A train uniformly accelerated with an acceleration of 10 ft. a second, passes two stations with velocities of 8.8 and 44 ft. per second. How far is it between the two stations?
4. How far will a body fall in 5 seconds, gravity being 32?
5. A body is projected upwards with a velocity of 640 ft. a second. How high will it rise? What will be its velocity at the end of the 20th second, also at the end of the 30th second?
6. Describe Atwood's machine.
7. A weight of 2 lbs. hangs over the edge of a smooth table and draws a weight of 50 lbs. laid on the table. What velocity will be acquired in 3 seconds?

SECOND YEAR.

LAND SURVEYING.

Examiner: A. A. Mactavish.

1. Describe Gunter's chain.
2. Describe the cross-staff, and show the method of determining its accuracy.
3. Show how to place a line at right angles to another, using the chain only.
4. Plan the field from the adjoining notes, and determine its area, scale $\frac{1}{2}$ chain to an inch.

L. Offset.	Chain Line.	R. Offset.
	To O. A.	
	480	
37	350	
28	160	
	Left of O. C.	
	To O. C.	
	585	
	450	57
	320	40
	200	72
	100	47
	Left of O. B.	
	To O. B.	
	743	
382	290	
From	O. A. go	East.

III. PAPERS SET AT THE MATRICULATION EXAMINATION,

OCTOBER, 1880.

ENGLISH GRAMMAR.

Examiner: James Mills, M.A.

1. Analyze the following passage and parse the words *in Italics.*

> *There at* the foot of *yonder* nodding beech
> That wreathes *its* old fantastic roots *so* high,
> His listless *length* at noon-tide *would he stretch,*
> *And pore* upon the brook *that babbles by.*

2. Define the terms *gender, case, voice, relative pronoun*, and give an example of each.
3. Distinguish *gender* from *sex*, and write the masculine or feminine as the case may be, of *maid, marquis, dame, nephew, widow, boy, actor, earl.*
4. What is the use of the adjective? Write down the comparative and superlative of *good, bad, beautiful, much, near, old.*
5. Decline *I, she* and *which.*
6. Give the past tense and perfect participle of *eat, feed, last, lose, loose, leap, sell, sit, set.*
7. Combine the following statements into compound sentences:

> The great Southern Ocean is crowded with coral islands.
> It is crowded with submarine rocks of the same nature.
> These rocks are rapidly growing up to the surface.
> In time these rocks will rise above the ocean.
> These rocks will at length form new habitations for men.

8. Correct the mistakes in—

(*a*) These sort of arguments are out of date.
(*b*) I saw a black and white dog running together.
(*c*) As neither James nor George are going, let you and I go.
(*d*) Mind who you are talking to.
(*e*) He didn't ought to have broke the window.

GEOGRAPHY.

Examiner: J. Hoyes Panton M.A.

1. Name the principal rivers of Ontario. Give the direction in which they flow, and state where they empty.
2. Sketch a map showing the positions of the various Provinces of Canada.
3. Where, and what are the following: Mobile, Vienna, Ouse, Tasmania, Clyde, Emerson, Yarmouth, Rimouski, Goderich, Suez?
4. Name the different railroads that lead into Toronto.
5. Name some of the economic products of Ontario, and state the places where they are found.
6. Explain the terms: estuary, cape, delta, watershed, plateau.
7. Name the principal lakes of North America.

ARITHMETIC.

Examiner: A. A. Mactavish.

1. The product is 92,465, the multiplier is 5. What is the multiplicand?
2. If $\frac{3}{8}$ of a ship be worth $14,000, what is the value of $\frac{3}{5}$ of it?
3. Sold two colts at $75 and $85 respectively, and received $\frac{1}{5}$ in cash, and the rest in flour at $5 per barrel. How many barrels of flour were received?
4. Add together $\frac{1}{2}$, $\frac{3}{4}$, $\frac{3}{5}$, .05, .123 and 42$\frac{1}{5}$.
5. Multiply .00124 by 42.368.
6. Simplify $\frac{1\frac{1}{2} + 2\frac{1}{3}}{3\frac{1}{4} + 4\frac{1}{5}}$ of $\frac{.5}{.25}$
7. $120 is divided among *A*, *B* and *C*. As often as *A* gets *one* dollar, *B* gets *two* and *C* gets *three*. How much does each receive?
8. How many more revolutions will the front wheel of a carriage make over that made by the hind wheel in going a distance of one mile, circumference being 10 and 12 feet respectively?

READING, DICTATION, AND COMPOSITION.

Examiner: J. Hoyes Panton, M.A.

Reading.

1. Fourth Book, page 182. Read the last four stanzas. Beginning on page 247, read twenty lines.

Dictation.

2. Page 208. Write from "*having——surrender.*"

Composition.

3. Contrast a professional life with that of an agriculturist.

APPENDIX E.

ONTARIO AGRICULTURAL COLLEGE.

Class Lists.

Easter Examination, 1880.

FIRST YEAR.

Class.	Agriculture.	Practical Examination on Live Stock.	Inorganic Chemistry.	Organic Chemistry.	Geology and Physical Geography.
HONOURS. I.	1 Motherwell. 2 Phin, R. J. 3 Ross, J. G. 4 Howitt. 5 Dickinson, C. 6 Phin, W. E. 7 Leask. 8 Cuppage. 9 Denman. 10 Grindley.	1 Howitt. 2 Phin, W. E. 3 Cuppage. 4 Patton. / Phin, R. J. 6 Motherwell.	1 Howitt. 2 Motherwell. 3 Newton. 4 Ross, J. 5 Dickinson, C. 6 Dickinson, S. 7 Phin, R.	1 Motherwell. 2 Ross, J. 3 Dickinson. 4 Phin, W. 5 Howitt.	1 Howitt. 2 Ross, J. 3 Dickinson, C.
II.	1 Horne. 2 Hill. 3 Ward. 4 Ballantyne. 5 Glass. 6 Chipman. / Fotheringham. 8 Sutherland. 9 Mylne. 10 Pope, H. / Newton. 12 Landsboro. 13 Patton. 14 Surtees. / Dickinson. 16 Cross. 17 Duthie. 18 Segsworth. 19 Gibson. 20 Nicol. 21 Macfarlane.	1 Denman. / Horne. 3 Cross. 4 Macfarlane. 5 Fotheringham. 6 Duthie. 7 Ballantyne. 8 Dickinson, C. 9 Ross, J. G. 10 Leask. 11 Roberts. 12 Noble. / Dickinson, S.	1 Torrance. 2 Landsboro. 3 Phin, W. 4 Hermon. 5 Nichol. 6 Cuppage. 7 Charlton. 8 Skaife. 9 Pope, H. 10 Surtees. 11 Wilson. 12 Robins. 13 Fotheringham. 14 Minard.	1 Hermon. 2 Nicol. 3 Newton. 4 Landsboro. 5 Dickinson, S. 6 Phin, R. 7 Wilson, W. 8 Horne. 9 Cuppage. 10 Torrance. 11 Ballantyne.	1 Fotheringham. 2 Dickinson. / Landsboro. 4 Horne. 5 Ross, W. 6 Skaife.

CLASS LISTS—FIRST YEAR—*Continued.*

Class.	Agriculture.	Practical Examination on Live Stock.	Inorganic Chemistry.	Organic Chemistry.	Geology and Physical Geography.
PASS. III.	1 Gordon. 2 Wilson. 3 McNaughton. 4 Ross, W. 5 Torrance. 6 Small. 7 Jones. 8 McIlquham, W. 9 Roberts. 10 McIlquham, J. 11 Hermon. 12 Noble. 13 Irving. 14 Minard. 15 Anderson. 16 Lindsay, S. 17 Willis. 18 Skaife. 19 Jarvis. 20 Patton. 21 Robins. 22 Lindsay, W. 23 Watt. 24 Jackson. 25 Woodley. 26 McLachlan. Fenton. Pope, L. Hogarth.	1 Chipman. 2 Jones. 3 Woodley. 4 Lindsay, W. 5 Grindley. 6 McIlquham. 7 Pope, L. 8 McIlquham, J. 9 Nicol. 10 McNaughton. 11 Sutherland. Pope, H. 13 Gordon. 14 Ross, W. 15 Lindsay, S. Glass. 17 Skaife. 18 Newton. 19 Minard. 20 Landsboro. 21 Anderson, H. 22 Mylne. 23 Robins. 24 Hermon. 25 Willis. 26 Gibson. 27 Hill. 28 Small. Wilson, W. Watt. Ward. Fenton. Irving. Torrance. Surtees. Segsworth. Charlton. Hogarth. Jackson. Jarvis. McLachlan.	1 Grindley. 2 Patton. 3 Segsworth. 4 Cuppage. Leask. 6 Ward. 7 Ross, W. 8 Sutherland. 9 Horne. 10 McNaughton. Woodley. 12 Gibson. 13 Ballantyne. 14 Jones. 15 Lindsay, W. 16 Cross. 17 Glass. 18 Small. 19 Chipman. 20 Denman. 21 Duthie. 22 Willis. Anderson, H. 24 Macfarlane. 25 McIlquham, W. 26 Gordon. 27 McLachlan. 28 Noble. 29 Jarvis. 30 Jackson. 31 Roberts. 32 Mylne. 33 Watt. 34 Lindsay, S. 35 Irving. 36 McIlquham, J.	1 Charlton. 2 Ross, W. 3 Patton. 4 Pope, H. 5 Robins. 6 Segsworth. 7 Macfarlane. 8 Gordon. 9 Skaife. 10 Grindley. 11 Pope, L. 12 Anderson, H. 13 Fotheringham. 14 Glass. 15 Jones. 16 Sutherland. 17 Denman. 18 Ward. 19 Minard. 20 Surtees. 21 McLachlan. 22 Mylne. 23 Woodley. 24 Irving. 25 Chipman. 26 Roberts. 27 McIlquham, W. 28 Leask. 29 Cross. 30 Lindsay, S. 31 McNaughton. 32 Gibson. 33 McIlquham, J. 34 Noble. 35 Small. Fenton. Lindsay, W. Jackson. Willis. Duthie. Watt. Jarvis.	1 Wilson, W. Lomas. 3 Stubbs. 4 Macaulay. 5 Phin, W. 6 Minard. 7 Jones. 8 Cross. 9 Patton. Gibson. 11 Lindsay, S. 12 Roberts. 13 Glass. 14 Wilson, S. 15 Macfarlane. 16 McClelland. 17 Noble. 18 Ward. 19 Woodley. 20 Holterman. 21 Watt. 22 Lindsay, W. 23 Webster.

Names unnumbered are those of students who failed to pass.

CLASS LISTS—FIRST YEAR—*Continued.*

Class.	Botany.	Zoology.	English Literature and Composition.	Veterinary Anatomy.	Veterinary Materia Medica.
HONOURS. I.	1 Howitt. 2 Dickinson, C. 3 Dickinson, S. 4 Horne. 5 Landsboro. Skaife.	1 Phin, R. 2 Phin, W. Ross, J. 4 Dickinson, C. 5 Howitt. Motherwell. 7 Newton. 8 Pope, H. 9 Nicol. 10 Torrance. 11 Horne. 12 Wilson, W. 13 Landsboro.	1 Howitt. 2 Ross, J. 3 Motherwell. 4 Dickinson, C. 5 Fotheringham. 6 Phin, W. 7 Phin, R.	1 Phin, R. 2 Motherwell. 3 Newton. 4 Howitt. 5 Ross, J. 6 Phin, W.	1 Ross, J. J.

CLASS LISTS—FIRST YEAR—*Continued.*

Class.	Botany.	Zoology.	English Literature and Composition.	Veterinary Anatomy.	Veterinary Materia Medica.
HONOURS. II.	1 Ross, J. 2 Minard. 3 Macaulay. 4 Fotheringham. 5 Phin, W. 6 Patton. 7 Jones.	1 Patton. 2 Ward. / Charlton. / Ballantyne. 5 Hermon. 6 Fotheringham. 7 Small. 8 Anderson. 9 Glass. 10 Gordon. 11 Lindsay, S. 12 Macfarlane. 13 Dickinson, S. 14 Ross, W. 15 Cuppage. 16 Watt. 17 Segsworth.	1 Newton. 2 Torrance. 3 Wilson, W. 4 Small. 5 Robin. 6 Gordon. 7 Cuppage. / Pope, H.	1 Horne. 2 Landsboro. 3 Nichol. / Charlton. 5 Segsworth. 6 Ballantyne. 7 Dickinson, S. 8 Fotheringham. 9 Cuppage. 10 Torrance. 11 Hermon.	1 Phin, W. 2 McClelland. 3 Horne. 4 Howitt. 5 Lomas. 6 Dickinson, C. Dickinson, S. / Fotheringham 9 Ward. 10 Minard. 11 Jones. 12 Cross.
PASS. III.	1 Wilson, W. / Webster. 3 Cross. 4 Ward. 5 Lindsay, S. 6 Holterman. 7 Ross, W. 8 Lindsay, W. / Gibson. / Roberts. 11 Lomas. 12 Wilson, S. 13 Noble. 14 Macfarlane. 15 Glass. 16 Woodley. Hogarth. Stubbs. Watt.	1 Denman. 2 Leask. 3 Skaife. 4 Robins. 5 McIlquham, W. / Noble. 7 Grindley. 8 Sutherland. 9 Woodley. 10 Lindsay, W. / Roberts. 12 McNaughton. 13 Jones. 14 Chipman. / Irving. 16 Minard. 17 McLachlan. 18 Mylne. 19 Surtees. Cross. Gibson. Duthie. Willis. Jackson. Jarvis.	1 Nichol. 2 Pope, L. 3 Grindley. 4 Ballantyne. / Segsworth. 6 Skaife. 7 Jones. 8 Fenton. 9 Macfarlane. 10 Charlton. 11 Landsboro. 12 Ward. 13 Horne. 14 Ross, W. 15 Chipman. 16 Cross. 17 Glass. 18 Hermon. 19 Anderson. 20 Sutherland. 21 Leask. 22 Dickinson, S. / Minard. 24 Lindsay, S. 25 Woodley. 26 McIlquham, W. 27 Surtees. / Patton. 28 Lindsay, W. McLachlan. Hill. McNaughton. Gibson. Jarvis. Irving. Mylne. Jackson. Roberts. Noble. Denman. Willis. Duthie. Watt. Hogarth. McIlquham, J.	1 Lindsay, S. 2 Glass. 3 Sutherland. 4 Pope, H. 5 Robins. 6 McNaughton. 7 McIlquham, W. 8 Small. 9 Leask. / Chipman. 11 Wilson, W. 12 Gordon. 13 Skaife. / Minard. 15 McLachlan. 16 Patton. 17 Watt. 18 Macfarlane. / Mylne. 20 Cross. 21 Duthie. 22 Woodley. 23 Ross, W. 24 Irving. 25 Ward. 26 Willis. 27 Noble. 28 Jackson. 29 Gibson. 30 Dickinson. 31 Roberts. McIlquham. Surtees. Anderson, H. Lindsay, W. Jarvis. Jones. Grindley.	1 Webster. 2 Macaulay. 3 Glass. 4 Holterman. 5 Noble. 6 Ross, W. 7 Landsboro. 8 Wilson. 9 Woodley. / Lindsay, S. 11 Wilson, S. 12 Stubbs. 13 Lindsay, W. 14 Patton. 15 Roberts. 16 Macfarlane. 17 Skaife. 18 Gibson. 19 Watt.

Names unnumbered are those of students who failed to pass.

CLASS LISTS—FIRST YEAR—*Continued.*

Class.	Arithmetic.	Mensuration.	Book-Keeping.	General Proficiency.
HONOURS. I.	1 Motherwell. 2 Dickinson, S. 3 Phin, R. 4 Ross, J. 5 Phin, W. 6 Ballantyne. 7 Torrance.	1 Ross, J. G. Howitt. 3 Horne. 4 Fotheringham. 5 Dickinson, C. 6 Phin, W.	1 Howitt. Motherwell. 3 Nichol. 4 Ross, J. 5 Wilson. 6 Macfarlane. Minard. 8 Pope, L. Dickinson. 10 Phin, R.	1 Motherwell, W. Howitt, J. 3 Ross, J. G. 4 Phin, R. J. 5 Phin, W. 6 Dickinson, C. S.
HONOURS. II.	1 Nichol. 2 Dickinson, C. 3 Howitt. 4 Pope, L. Horne. 6 Sutherland. 7 Leask. 8 Landsboro. 9 Cross. 10 Ross, W. 11 Denman. 12 Wilson.	1 Cross. 2 Wilson. 3 Dickinson, S. 4 Noble.	1 Newton. Horne. 3 Robins. Denman. Fotheringham. 6 Ballantyne. Sutherland. 8 Chipman. 9 Phin, W. Ward. 11 Hogarth. 12 Leask.	1 Newton, J. 2 Ballantyne, W. 3 Nichol, G. 4 Fotheringham, J. 5 Horne, W. H. 6 Dickinson, S. 7 Torrance, W. P. 8 Cuppage, A. 9 Landsboro J. 10 Pope, H. 11 Wilson, W. A. 12 Hermon, E. B. 13 Leask, J. 14 Charlton, G. A.
HONOURS. III.	1 Robins. 2 Pope, H. Hermon. Gibson. 5 Fotheringham. 6 Small. Hogarth. Grindley. 9 Surtees. 10 Macfarlane, Mylne. 12 Noble. 13 McIlquham. 14 Ward. Charlton. 16 Roberts. McNaughton. 18 Minard. 19 Chipman. 20 Patton. 21 Watt. 22 Cuppage. 23 Newton. 24 Gordon. Hill. Glass. Irving. Anderson, H. Lindsay, S. Willis. McIlquham, J. Segsworth. Skaife. Duthie. Jackson. Lindsay, W. McLachlan. Jones. Jarvis. Fenton.	1 Ross, W. Ward. 3 Roberts. Gibson. 5 Watt. 6 Landsboro. 7 Macfarlane. 8 Patton. Glass. 10 Minard. Lindsay, S. Lindsay, W. Jones. Woodley.	1 Dickinson, S. Torrance. 3 Cuppage. 4 Grindley. 5 Pope, H. 6 Jones. 7 Gordon. 8 Patton. 9 Cross. 10 Skaife. 11 Mylne. Noble. 12 McNaughton. Small. 15 Hermon. Segsworth. 17 Ross, W. 18 Woodley. 19 Surtees. 20 Duthie. 21 Charlton. 22 Willis. 23 Glass. 24 Gibson. 25 Landsboro. 26 Irving. 27 McIlquham. 28 McIlquham. 29 Anderson. 30 Jackson. Lindsay, S. McLachlan. Fenton. Roberts. Watt. Lindsay, W. Jarvis.	1 Robins, W. P. 2 Segsworth, F. 3 McFarlane, D. 4 Gordon, W. 5 Sutherland, A. 6 Paton, W. 7 Grindley, A. W. 8 Ross, W. 9 Glass, W. 10 Ward, T. 11 Small, A. F. 12 Skaife, J. 13 Chipman, P. H. 14 Cross, A. 15 Minard, J. H. 16 McNaughton, J. 17 Denman, A. W. 18 McIlquham, W. 19 Lindsay, S. 20 Surtees, W. S. 21 Gibbon, W. J. 22 Mylne, R. C. 23 Anderson, H. 24 Noble, F. 25 Jones, G. 26 Duthie, J. 27 Roberts, P. 28 Woodley, F. E 29 Irving, C. E. 30 Willis, J. 31 McLachlan, D. 32 Lindsay, W. 33 Watt, J. 34 McIlquham, J. 35 Jackson, C. 36 Jarvis, C. 37 Hill, J. 38 Fenton, J.

Names unnumbered are those of students who failed to pass.

CLASS LISTS.—*Continued.*

SECOND YEAR.

Classes.	Agriculture and Arboriculture.	Practical Examination on Live Stock.	Agricultural Chemistry.	Analytical and Practical Chemistry.	Entomology.	Systematic and Economic Botany.	Meteorology.
Honours. I.	1 Joyce. 2 Reymond. 3 Holterman. 4 Ash. 5 Webster. 6 Clutton. 7 Anderson. 8 Macaulay.	1 Ash.	1 Chapman. 2 Macaulay. 3 Webster. 4 Joyce. 5 Holterman.	1 Webster. 2 Chapman.	1 Webster. 2 Macaulay. 3 Lomas. 4 Chapman. 5 Joyce. 6 Holterman.	1 Chapman. 2 Webster. 3 Ash.	1 Chapman. 2 Webster. 3 Reymond. 4 Holterman. 5 Joyce. 6 Lomas. 7 Macaulay.
Honours. II.	1 Dawes. 2 Lomas. 3 Stubbs. 4 Campbell. 5 Chapman. 6 Craig. 7 McClelland. 8 Wilson, S.	1 Dawes. 2 Lomas. 3 Holterman. 3 Campbell. 5 Wilson.	1 Lomas. 2 Clutton. 3 Ash. 4 Campbell. 5 Reymond.	1 Campbell. 2 Clutton. 3 Joyce.	1 Ash. 2 Wilson. 3 Clutton. 4 Campbell. 5 Dawes. 6 Reymond. 7 McClelland.	1 Joyce. 2 Reymond. 3 Dawes.	1 Clutton. 2 Campbell. 3 McClelland. 4 Stubbs. 5 Wilson.
Pass. III.	1 Webster. 1 Anderson. 3 Stubbs. 3 Macaulay. 5 Chapman. 6 Joyce. 7 Reymond. 8 Clutton. 9 Craig. McClelland.	1 Wilson. 2 Stubbs. 3 Anderson. 4 Dawes. 5 Craig.	1 Reymond. 2 Ash. 3 Dawes. 4 Craig.	1 Stubbs. 2 Anderson. 3 Craig.	1 Campbell. 2 Clutton. Craig.	1 Anderson. 2 Ash. 3 Dawes. 4 Craig.

Names unnumbered are those of Students who failed to pass.

CLASS LISTS—*Continued.*

SECOND YEAR.

	Classes.	English Literature and Composition.	Veterinary Pathology.	Veterinary. Materia Medica.	Mechanics.	Levelling and Land Surveying.	Book-Keeping.	Political Economy.	General Proficiency.
Honours.	I.	1 Macaulay. 2 Chapman. 3 Webster.	1 Clutton. Ash. 3 Webster.		1 Webster. 2 Macaulay. 3 Lomas. 4 Holterman.	1 Holterman. 2 Webster. 3 Macaulay. Wilson.	1 Macaulay. 2 Holterman. 3 Dawes. Webster.	1 Webster. 2 Lomas. 3 Holterman. 4 Macaulay. 5 Clutton. 6 Dawes.	1 Webster, J. L. 2 Holterman, R. Macaulay, H.
	II.	1 Holterman. 2 Dawes. 3 Lomas.	1 Lomas. 2 Macaulay. 3 Holterman. 4 Craig. 5 McClelland. Campbell. 7 Dawes. 8 Anderson.	1 Craig. 2 Webster. 3 Chapman. 4 Clutton. 5 Joyce. 6 Ash. Campbell.	1 Campbell. 2 Clutton. 3 Reymond. 4 Dawes. 5 Wilson. McClelland. 7 Chapman.	1 Lomas. 2 Chapman. 3 Dawes. McClelland. 5 Ash. 6 Campbell. Reymond.	1 Wilson. 2 Chapman. 3 Reymond. 4 McClelland. 5 Campbell. 6 Joyce. 7 Lomas.	1 Campbell. 2 Chapman. 3 Anderson.	1 Lomas, J. W. 2 Chapman, R. K. 3 Clutton, A. H. 4 Ash, W. E. 5 Dawes, M. A. 6 Campbell, D. 7 Reymond, A.
Pass.	III.	1 Anderson. 2 Joyce. 3 Campbell. 4 Clutton. 5 Wilson. 6 Ash. 7 Stubbs. Reynolds. Craig. McClelland.	1 Chapman. 2 Reymond. 3 Joyce. 4 Wilson. 5 Stubbs.	1 Dawes 2 Reymond	1 Stubbs. 2 Craig. 3 Ash. 4 Anderson. Joyce.	1 Clutton. 2 Joyce. Craig. Anderson. Stubbs.	1 Clutton. 2 Ash. 3 Anderson. Craig.	1 Wilson. 2 Ash. 3 Craig. 4 Stubbs. 5 McClelland. Reymond. Joyce.	1 Joyce, H. G. 2 Wilson, S. J. 3 Anderson, J. 4 Craig, W. 5 McClelland. 6 Stubbs, W.

Names unnumbered are those of Students who failed to pass.

APPENDIX F.

FINANCIAL TABLES.

1.—Appropriation Expenditure for 1880.
2.—Statement of Revenue for 1880.
3.—Estimated Expenditure for 1881.
4.—College in account with Farm and Garden.

Ontario Agricultural College.

1.—APPROPRIATION EXPENDITURE FOR 1880.

	$ c.	$ c.
A.—*Maintenance Account.*		
I.—*Food.*		
Meat, fish and fowl	2,388 15	
Bread and biscuit	913 50	
General groceries and butter	2,671 42	
II.—*Household Expenses.*		
Fuel	1,362 80	
Light	305 56	
Laundry, soap and cleaning	199 12	
Furniture and furnishing	372 43	
Repairs	681 47	
Servants' wages (women)	1,322 20	
III.—*Business Department.*		
Advertising, printing, postage, &c.	605 42	
IV.—*Miscellaneous.*		
Maintenance of chemicals	97 85	
Unenumerated	649 84	
V.—*Salaries and Wages*	9,994 01	
VI.—*Payments not provided for in Estimates.*		
Lumber for sidewalk (from college to city)	258 38	21,822 15
B.—*Capital Account.*		
I.—*Furniture and Furnishing*	1,980 99	1,980 99
		23,803 14

2.—STATEMENT OF REVENUE FOR 1880.

	$ c.	$ c.
Balances on board accounts paid by students (over and above labour done in outside departments)	2,401 02	
Tuition Fees	1,625 00	4,026 02
		4,026 02

3.—ESTIMATED EXPENDITURE FOR 1881.

	Voted for 1880 (92 Students).	Required for 1881 (130 Students).
A. *Maintenance.*	$ c.	$ c.
I.—*Salaries.*		
President, Professor of Natural History and English, and Resident Master	2,000 00	2,000 00
Professor of Agriculture and Farm Superintendent	2,000 00	2,000 00
Professor of Chemistry and Practical Chemist	1,000 00	1,500 00
Professor of Veterinary Science	600 00	700 00
Mathematical and Assistant Resident Master	500 00	600 00
Bursar and Storekeeper	500 00	600 00
Physician	300 00	300 00
Field and Live Stock Foreman	600 00	600 00
Foreman of Horticultural Department	600 00	600 00
Foreman of Mechanical Department	600 00	600 00
Matron and Housekeeper	400 00	400 00
Engineer	500 00	600 00
Assistant Engineer (for 6 months)	150 00	180 00
Janitor and Messenger	150 00	150 00
Instructor in Drill and Gymnastics		100 00
Temporary assistance	100 00	100 00
	10,000 00	11,030 00
II.—*Expenses of College.*		
Meat, fish and fowl	2,800 00	4,000 00
Bread and biscuit	1,300 00	1,600 00
General groceries and butter	2,900 00	4,200 00
Laundry, soap, and cleaning	200 00	300 00
Fuel	1,600 00	2,500 00
Light	300 00	1,000 00
Furniture and furnishing	500 00	550 00
Repairs	650 00	650 00
Maintenance of chemicals	100 00	150 00
Advertising, postage and stationery	600 00	600 00
Unenumerated	600 00	700 00
Women servants' wages (12 in 1880, 16 in 1881)	1,300 00	1,750 00
	22,850 00	29,030 00
B. *Capital Account.*		
I.—*Furniture and Furnishing*	2,000 00	2,000 00
	24,850 00	31,030 00

4.—THE COLLEGE IN ACCOUNT WITH THE FARM AND THE GARDEN FOR THE YEAR 1880.

Dr.	$ c.	$ c.	c.
(a) With Farm.			
To Potatoes..... 300 bags .....at	0 50	150 00	
" Turnips..... 28 bushels..... ... "	0 15	4 20	
" Wheat ..... 120 " ... . "	1 10	132 00	
" Cordwood		35 00	
" Carting for College.....		30 00	
" Keep of College horse.....		100 00	
" Carpenter's work		70 00	521 20
(b) With Garden.			
To Asparagus..... 376 bunches..... at	0 04	15 04	
" Apples.. .. .. 50 barrels .... "	1 00	50 00	
" Beans .... 7½ bushels in pod..... "	1 00	7 50	
" Beets .... 30 " .. .. "	0 40	12 00	
" Cabbage ... ... 54 dozen heads ..... "	0 50	27 00	
" Cauliflower ..... 12 " ..... . "	1 00	12 00	
" Celery .... 180 heads . . .. "	0 08	14 40	
" Carrots ..... 35 bushels..... ..... "	0 20	7 00	
" Cucumbers ..... 2 " ..... "	1 50	3 00	
" Lettuce .... 51 dozen..... "	0 20	10 20	
" Onions..... 22 bushels .. .. "	0 75	16 50	
" Potatoes..... 43 bags .... "	0 50	21 50	
" Parsnips ..... 26 bushels ... . "	0 50	13 00	
" Peas..... 13 " in pod..... "	1 00	13 00	
" Rhubarb ..... 235 bunches .... "	0 04	9 40	
" Spinage .... 10½ bushels ..... . "	1 00	10 50	
" Turnips.. . ..... 12 " .... "	0 15	1 80	
" Tomatoes..... 26 " .... "	0 40	10 40	
" Vegetable Marrow 107 .... "	0 07	7 49	
" Milk ....3653 gallons..... .... "	0 08	212 24	473 97
			995 17
Cr.			
By students' labour for year, as reported by foremen, approved by Farm Superintendent, and credited on board and washing account		4,347 23	4,347 23
By Balance.....		3,352 06	

APPENDIX G.

After entering on my duties as President a little over a year ago, I endeavoured to get from Europe and the United States, such information as would enable me to give the latest statistics on the subject of agricultural education in those countries: but having received answers from only a portion of the agricultural institutions, I prefer to postpone the matter till next year, and copy the following from the report of 1878, written by my predecessor, rather than give only partial information of a later date.

AGRICULTURAL EDUCATION IN GERMANY AND THE UNITED STATES.

"What I desire to do in this very brief Appendix is to give an outline of the manner in which agricultural education is carried out in Germany and the United States. I take those two as examples, although only four European countries are now without similar institutions. I will not rehearse the arguments used by the advocates of this species of education when claiming support for their colleges from the State; those have already been used here, and acted upon in the establishment and annual support of this institution by our Province.

A.—Germany.

This country is, as usual, ahead of all the rest of the world in this matter of agricultural education. There are four steps in her system, viz:—

1. Agricultural Farm Schools.
2. Agricultural Middle Schools.
3. Agricultural Colleges.
4. Agricultural Courses in Universities.

The course of instruction in the first two classes embraces even more than is found in the curriculum of our own Agricultural College, including as it does, a thorough grounding in a continued literary education, in the elements of the sciences, in veterinary lessons, in theoretical and practical agriculture, and in all kinds of farm work, learned on the farms, which are attached to both those classes of schools. Besides those under the charge of some of the old States, there are 156 of the two classes of schools under the direct control of the Empire; though 42 of them are devoted to the study of specialities, such as vine and grape culture, horticulture, bee-keeping, etc. The third step is the Agricultural Colleges, of which there are six in the German Empire, situated at Eldend, Proskau, Popplesdorf, Munich, Thorau and Hohenheim. In these, the elementary scientific education already obtained is applied directly to agriculture in extensive laboratories and dissecting rooms, fitted up with all the necessary apparatus and appliances, and on large farms of from 800 to 1,500 acres. Besides this practical application, the theoretical instruction is greatly widened, including all the departments of agriculture, agricultural science, veterinary science, agricultural statistics, finance, laws, taxation, etc., etc., in other words, the curriculum of each is wonderfully complete. Having finished his course,

the student is required to enter the ranks of agriculturists and prove himself successful, after which he can attend, thoroughly equipped, agricultural departments of nine of the great National Universities. Besides these schools and colleges, are 43 experimental stations; and the cost of all—schools, colleges and experimental stations—is borne by the State.

B.—United States.

"I have in the accompanying table grouped together the facts regarding 32 out of 39 Agricultural Colleges of the neighbouring Republic. During 1877 I placed myself in communication with each of those Colleges, and received the Reports of the numbers mentioned, so that the table is absolutely correct for the year 1876. In 1862, Congress passed what has been usually referred to as the Land Script Act, entitled "An Act donating lands to the several States and Territories which may provide Colleges for the benefit of Agricultural and the Mechanic Arts." By this Act, some 9,600,000 acres of the public domain were set aside for this purpose on the basis of 30,000 acres for every Senator sent by any State or Congress to the Senate, such State or Territory having, of course, the right of acceptance or refusal; but the acceptance bound by the conditions of Sec. 4, which required that the interest of all moneys derived from the sale of lands donated "shall be inviolably appropriated by each State which may take and claim the benefit of this Act to the endowment, support and maintenance of at least one College, where the leading object shall be, without excluding other scientific and classical studies, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as Legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes, in the several pursuits and professions in life."

Almost every State has now taken advantage of this liberal offer. The Act evidently contemplated the erection and maintenance in each State of an Agricultural and Mechanical College; but as it did not expressly say so, a contest arose in many of the States between the advocates of existing colleges and those desiring to carry out the spirit of the Act. It has resulted, in twenty States, in the endowment of some already existing college or university, which, in order to comply with the conditions, bought a farm, and added to its departments of instruction a well equipped agricultural department. In some nineteen of the States honesty won the day, and separate Agricultural and Mechanical Colleges were erected, and received the endowment, of which I have given in the accompanying table the statistics of sixteen. Only two or three of the former class have been successful, the agricultural department being overshadowed by the other departments of the university—any exception being caused by the noted excellence of the professors in the agricultural department. Of the latter class, the great majority have been successful—many extremely so. Fourteen of the nineteen are as yet quite young, however, having only been fully in operation during the last decade.

The table needs no comment, but is largely self-explanatory. The number of professors in each college is usually six or seven, and of assistants about the same. The average salary of a professor is $2,000—many being above that figure, and only three below it. Of course in the agricultural departments of the universities, the salaries are often double those figures, but these are professors of a regular university, as well. The average salary of the president is about $3,200, many receiving above that sum and none less than $3,000. As before, the presidents of the universities in which there are agricultural departments receive, of course from $4,000 to $6,000; but no precedent can be taken from them. The total number of the professors and assistants in the Agricultural Colleges of the United States, during the year mentioned was 473, and the total number of students 4,211. The former number is a third too large, owing to the universities counting their regular professors with the agricultural department. Turning from the equipment and attendance to the maintenance, it has been found almost impossible for the first class to obtain any assistance from the State, for the rival colleges or universities oppose that on the grounds that their agricultural departments have only been attached to get the endowment; but the second class, have, in all classes, been assisted in most instances very liberally, by yearly grants from the State. The interest on the lands sold

by each State will be seen to be very variable, arising partly from the size of the State but mainly from the favourable or unfavourable location of the lands. The interest received by all the Colleges during 1876 was $525,745, or an average of about $13,500 to each. Many of them have been additionally endowed by individuals, by subscriptions, or by counties, and the annual maintenance expenditure of those of them from which I could get a financial statement was for the year given somewhere between $25,000 and $38,000. And that is outside of any expenditure on capital account. And lastly, turning from equipment, attendance and maintenance, to a consideration of the several courses of study, it may simply be said that neither our space nor our time would allow even a synopsis of them. The great faults of the majority of them are the attempt to teach too many subjects superficially, to give too many optional courses, to leave out a course of farm apprenticeship, and to make their curriculum too literary, and not sufficiently technical."

The following table requires no further explanation.

JAMES MILLS,
President

AGRICULTURAL COLLEGES OF THE UNITED STATES, 1876.

STATE.	Locality in the State.	NAME OF THE COLLEGE.	Whether an 'independent college or a department of a university.	No. of Professors and Assistants in the Agricultural and Mechanical College.	No. of Students in the Agricultural or Mechanical College.	No. of Students pursuing Agricultural or Mechanical Studies.	Interest on Investments made from sale of Land Scrip (Act of 1862) Endowment.	No. of Acres in Farm.	Value of Farm (not buildings).
							$		$
Maine	Orono	State College of Agriculture and Mechanic Arts	In. College	8	115	115	7,861	370	10,000
New Hampshire	Hanover	Dartmouth College	Univ. Dept.	11	24	24	4,800	365	21,000
Vermont	Burlington	University of Vermont and State Agricultural Col.	Univ. Dept.	8	23	23	8,130	no farm.	
Connecticut	New Haven	Yale College—Sheffield Scientific School	Univ. Dept.	31	230	230	8,100	no farm.	
Rhode Island	Providence	Brown University—Agri. and Mech. Department.	Univ. Dept.	13	35	35	6,624	no farm.	
Massachusetts	Amherst	Massachusetts Agricultural College	In. College.	8	111	111	8,022	383	37,000
New York	Ithaca	Cornell University—College of Agriculture.	Univ. Dept.	21	58	58	35,000	150	22,000
New Jersey	New Brunswick.	Rutger's College—Scientific School	Univ. Dept.	10	42	42	6,960	100	45,000
Delaware	Newark	Delaware College	Univ. Dept.	8	43	16	4,980	not known	
Pennsylvania	Centre County	Pennsylvania Agricultural College	In. College.	13	161	161	24,420	600	75,000
Maryland	College Station.	Maryland Agricultural College	In. College.	6	77	40	6,900	285	14,250
Virginia	Blacksburgh	Virginia Agricultural and Mechanical College	In. College.	10	255	255	20,639	250	28,000
N. Carolina	Orangeburgh	Claflin University—Agricultural Department.	Univ. Dept.	9	61	61	7,500	not known	
S. Carolina	Chapel Hill	N. Carolina University—Agricultural Departm't.	Univ. Dept.	6	40	40	10,000	116	10,000
N. Georgia	Dahlenoga	N. Georgia Agricultural College	In. College.	8	93	93	14,000	60	2,500
S. Georgia	Athens	State College of Agriculture and Mechanic Arts.	In. College.	5	245	30	3,000	25	1,000
Alabama	Auburn	Alabama Agricultural and Mechanical College	In. College.	7	104	80	16,224	100	2,200
Mississippi	Rodney	Alcorn University—Agricultural Department	Univ. Dept.	4	57	57	5,679	250	5,500
Louisiana	New Orleans.	Louisiana Agricultural and Mechanical College	In. College.	6	209	115	13,734	600	40,000
Texas	Bryan	Texas Agricultural and Mechanical College	In. College.	6	50	50	12,000	2,200	20,000
Kansas	Manhattan	Kansas State Agricultural College	In. College.	16	303	303	20,491	255	25,500
Arkansas	Fayetteville	Arkansas Industrial University.	In. College.	12	45	45	10,400	160	12,000
Tennessee	Knoxville.	East Tennessee University—Agricultural Depart.	Univ. Dept.	12	58	58	23,760	260	24,050
Kentucky	Lexington	Kentucky University—Agricultural Department.	Univ. Dept.	8	94	94	9,900	433	130,000
Ohio	Columbus	Ohio Agricultural and Mechanical College.	In. College.	11	140	126	30,000	320	200,000
Indiana	La Fayette.	Pardue University—Agricultural Department.	Univ. Dept.	8	71	71	20,314	159	47,700
Illinois	Urbana	Illinois Industrial University	In. College.	15	187	187	28,200	570	56,000
Missouri	Columbia	Missouri University—Agricultural Department.	Univ. Dept.	6	70	70	3,040	640	60,000
Michigan	Lansing	Michigan Agricultural College	In. College.	13	166	166	16,880	676	47,320
Iowa	Ames.	Iowa State Agricultural College	In. College.	15	300	75	34,822	850	51,000
Minnesota	Minneapolis	Minnesota University—Agricultural Department.	Univ. Dept.	8	6	6	13,901	120	12,000
Wisconsin	Madison	Wisconsin University—College of Agriculture.	Univ. Dept.	16	124	124	13,490	196	40,000

AGRICULTURAL COLLEGE OF CANADA, 1879.

Ontario	Guelph	Ontario Agricultural College	In. College.	7	162	162	none	550	55,000

REPORT

OF THE

PROFESSOR OF AGRICULTURE

AND

FARM SUPERINTENDENT.

ONTARIO AGRICULTURAL COLLEGE AND EXPERIMENTAL FARM,
31st October, 1880.

To the Honourable S. C. Wood,
Commissioner of Agriculture:

SIR,—I have again the honour of reporting upon the Field, the Live Stock, Horticultural, Mechanical, Experimental, Practical Instruction, and allied subjects under my charge here, and on this occasion I shall preface with some remarks on what is at once a matter of great national value as well as one that has largely brought our School to its present status.

It is now four years since we imported the animals that still principally compose the various herds and flocks of the farm. Their conduct and standing during these years are well known to all who take an interest in the progress of education and the main source of the future wealth of the Dominion. Nationally, and in the eye of the world, we are now articled to a business in beef and mutton that may reach, even in our time, as far as the wealth of any other country, and certainly much farther than any other, proportionately to age. It has been the duty of this institution to take a prominent part in the maintenance of good specimens of the leading breeds of cattle and sheep, and with reference to success in most essentials it has no reason to be dissatisfied. Having in view the increasing importance of this subject and the continuous annual drain by the public upon our herds and flocks, as well as the very largely extended educational demands upon the same thing, I am again called upon to advise why certain animals of certain breeds should be obtained for our Farm.

In the first place, I must point out that whatever is done by the Government in the matter of importations to this Farm, can be but a small thing compared with what is done by other breeders in the Province, who do so, almost regularly, annually. All the surplus cattle and sheep that can be produced from this Farm annually is not one-hundredth part of what is done by others, and not one-thousandth of what is required throughout the Province.

Secondly, in place of our being in opposition to other breeders, as some may contend, we are actually doing the advertising for them. It is a fact in my own personal knowledge, and also given me from many farmers, and some breeders themselves, that the prominence given the question of Live Stock in our annual reports, and the distribution of our surplus animals during the last five years, have very largely increased the demand

for such stock, so that many of the sales by breeders can be directly traced to our connection. It is also a fact that the hundreds from long distances who call and do not obtain from us, at once proceed to other herds and flocks, and purchase what they would not otherwise have done had the Experimental Farm not been in existence.

Thirdly, the many young men who have been educated here and who took keen interest in the Live Stock department, are not only returning or writing for certain animals for themselves, but have sent many others for the same purpose, who otherwise were indifferent to improved stock; the most of those had to call upon other breeders, by reason of our own want of supply.

Fourthly, the score of direct breeders who may be jealous of our limited efforts are an unit to the thousands now demanding the continuance and extention of our Live Stock department; the latter say, you have opened up to the average farmer what exactly suits him; he knows that on the second week of September every year he has the opportunity of obtaining a choice from several breeds of cattle, sheep and swine, at prices entirely at his own making, for no reservations are made and few private sales have been allowed, even at much higher figures than were offered in very many instances.

Fifthly, farmers are now satisfied in regard to the judiciousness of our moderate system of feeding breeding stock; the four years' proof has been extensive and severe.

Sixthly, there is also manifest satisfaction at the greater care bestowed upon the culling of young animals; offering only the best the first season and preparing the inferior for next by a gradual plan of careful feeding,—for example, the shearling rams that brought an average of $49.35 on the 10th September last, were the culls of 1879, such animals that, though sound in constitution, were not of that stamp which I considered should be offered by the Government to their own people, and which certainly would not have fetched $10 each.

Seventhly, the situation of the Farm does not make it one of local interest in regard to the service of new animals to other herds and flocks; ewes have been sent from over 200 miles, and sows from 100 miles distant, besides the fact that we have had to refuse several by reason of crowding. As to this see details in chapter on "public patronage to our various rams."

In short it may be asked, is it possible in these times to have too much stock in the country, whether by the agency of private or of public means? In saying no, I must point out that we cannot compare ourselves with such an older and more wealthy condition of things as obtain in the United States. Our average farmer yet needs help in respect to placing, for example, the essence for beef and mutton production within his easy reach. It is too risky for him to import the one or two animals he needs, and he is not prepared to give the regular breeder a large profit for such a transaction. But the Government wants no direct profits as does the special breeder, and here I must confess to regret that the Government has been obtaining profits from the sale of their Live Stock here. While this may be gratifying to the management, it need not be so to the Government that is earnestly striving for the development of all branches of its rural economy.

When, therefore, it is now matter of practical history that a Government can be a farmer and obtain direct profits from the transactions thereof, there cannot possibly be any objections to increasing the number and raising the standard of several of our breeds of cattle and sheep here. The thousands want it, whatever the score of special breeders may say to the contrary. If we cannot offer more in future than we have been doing, prices are likely to rule high, and the lower and slower will be the character of our agriculture.

In order to meet the increased demand it has been suggested to us by several leading farmers that besides the material of the Ontario Experimental Farm, the Government should appropriate $100,000 for the purpose of importing cattle and sheep next year. This, they consider, would be acting in the spirit of the times, and subserve more actual good than all the agricultural shows, or agricultural inquiries on foot. I am not prepared to discuss this point at present, but shall proceed to submit some advice regarding the educational aspect of the proposed new importations for the College and Farm.

All the public are not aware that I have been gradually extending the plan by which students are familiarized with the different breeds of Live Stock; the actual lecturing now

takes up but one-third of the whole time allowed for this division of my duties, the rest being devoted to practical examination of points, handling and comparing different animals of the same breed and of different breeds, and judging generally. When we think we are conversant with the history, characteristics and standard of points appertaining to any particular breed, we take a bull, or cow, or ram, or ewe to the class-room platform, where, in the presence of all the students, I first of all name and handle all its parts, point out wherein it is good, wherein poor; and thereafter *every student* is made to do the same thing, give reasons for what he advances, answer questions put to him by his fellows, and generally is submitted to a careful examination by myself. I have had satisfaction in this kind of work, by the warm interest taken in it by every student, without exception—the one complaint being that they have not had enough of it. The complaint is sound if the result of their own final examination is evidence of acquirements under allowance of short time, on which question I beg to refer you to my introductory remarks of last year's report. But whether for that reason, or for those of but ordinary ability, on the point both of teacher and scholar, I am convinced that the ordinary lessons in this connection must be supplemented by regular monthly and weekly drill during winter in the handling and judging of all breeds of cattle and sheep. Just as my older head had to get years to acquire the art of *systematic teaching*, so it need not be surprising that younger ones require months in place of weeks to carry the ground-work of this branch of their profession. It is very desirable that judging of Live Stock at exhibitions should be brought to a profession, in place of being a complimentary position in the hands of the few, liable thus to prejudice and unskilled dictum. It is part of our duty to make judges, and with the help of the Government, I have no fear of placing such a staff in the hands of the Ontario farmers, ten years hence, as shall be a credit to any country. To do this, our College must be replete with animals of the leading breeds of cattle, horses and sheep, suitable for Canada at least, and opportunity must be given for repeated lessons as already explained. Our importations of 1876 have now served their end with us and cannot longer be kept as a matter of profit or the same value educationally. They will, however, be good to others who do not possess blood from the same source, and I therefore propose that they should form part of the public sale in September, 1881; so that, in addition to the ordinary sale of about $3,000 of surplus Live Stock, we would receive something like $2,500 for old bulls, cows, rams and ewes—say $5,000, for certain. I may also state that since 1876 we have sold over $10,550 of surplus Live Stock. Finally, I beg to recommend the appropriation of $15,200 for the importation of the following animals—the estimate to include all expenses delivered here, and the very best to be obtained :—

Clydesdale horse and two mares	$3,000
Shorthorn bull and three cows	3,900
Hereford " "	1,500
Angus or Aberdeen Poll bull and three cows	2,000
Ayrshire bull and three cows	1,200
English Leicester ram and six ewes	400
Border " " "	450
Lincoln " " "	450
Cotswold " "	500
South Down " "	500
Oxford Down " "	400
Hampshire Down " "	450
Shropshire " " "	450
Total	$15,200

These should be sent for in February first, so as to be on hand here, through quarantine, by the 1st of August, in time for exhibitions and for notice at our public sale.

I.—THE WEATHER.

As usual, we present a Weather Table from April to September, inclusive, embracing the season of growth and maturing in connection with farm crops in this country. This should always receive a careful study before reading, or criticism, of results of field cropping or of plot experiments.

During April the lowest mean temperature of any day occurred on the 11th, when the thermometer ranged in the neighbourhood of 24°, and four days afterwards, or on the 15th, we had the highest mean for April, 58°. As the barometric pressure is not *now*, or long afterwards, a fact for a farmer's use, except in association with rainfall and temperature, I shall leave its study to the more scientific. Rain fell on ten separate days, and altogether to the depth of 3½ inches during April.

May was characterized by a low mean temperature of 34° on the 1st, and of 74° as the highest on the 25th, while rain fell on no fewer than sixteen days, and to the depth of 3⅛ inches. As a seeding month, therefore, May was somewhat unpropitious, though good for germination towards the end of it.

June had no higher mean than May (on the 23rd), and the lowest mean reached only 53° on the 1st; the rainfall was also small, not 3 inches, though spreading over twelve days. This important month for germination and growth was in most respects a good one, with the exception of a drought—warm high winds and no rain—from the 14th to the 22nd, which was directly responsible for the blight that came over most of our cereal crops.

During July the highest mean temperature of the season—81°—occurred on the 9th, and the lowest kept up to 59½°. The unusual drizzling of 1880 was upheld by this warm month as well as others, rain falling on as many as fifteen days, but only to the depth of 1⅛ inch over all, and at no time consecutive was fresh moisture wanting for more than three days. This association of much heat and much continuous moisture, in June and now, was responsible for the large extent of rust on cereals.

The heaviest rainfall came in August, yet distributed over sixteen days, mostly towards the end of the month, while the mean temperatures were, 77° on the 9th, and 58° on the 26th.

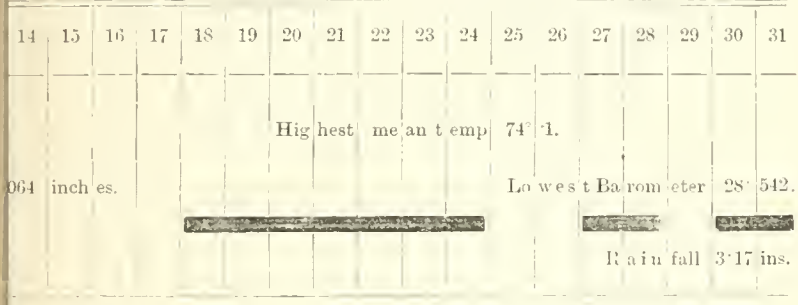
September came with a reduction to 73° on the 2nd and 47° on the 23rd, with a rainfall of 4 1-5 inches during nine days.

So then, altogether, we had rain during no fewer than 78 days out of the 182, though only to the depth of 19½ inches. The periods of drought were from the 14th to the 22nd June, and from the 4th to the 17th September. The mean range of temperature for the season was 59½°; the highest mean record of barometric pressure was 29·948 on the 22nd July, the lowest, 28·190 on the 10th April; the mean of the barometer for the season was 28·897 inches.

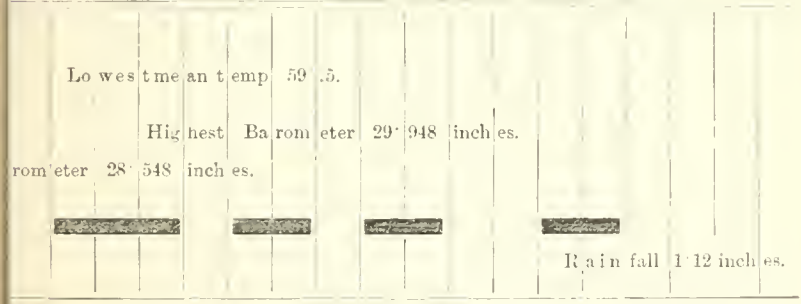
As another form of weather record, I beg to submit chart showing the agreement, or disagreement, of barometer, thermometer and rain-gauge.

mental Farm.

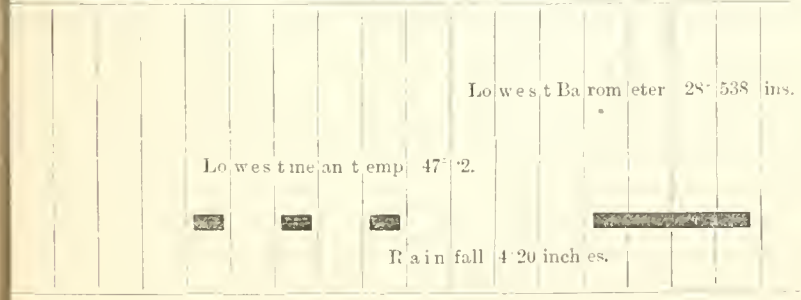
MAY.



JULY.



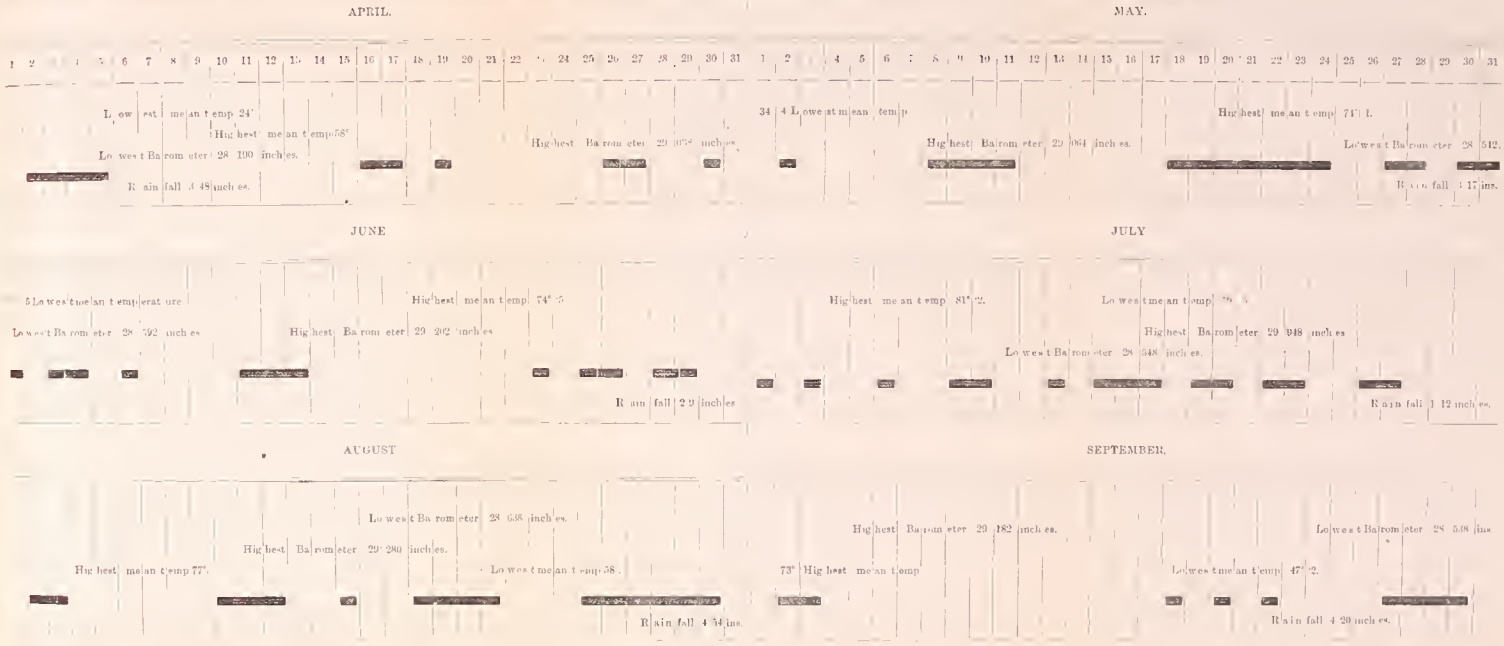
SEPTEMBER.



I.—THE WEATHER.

1880

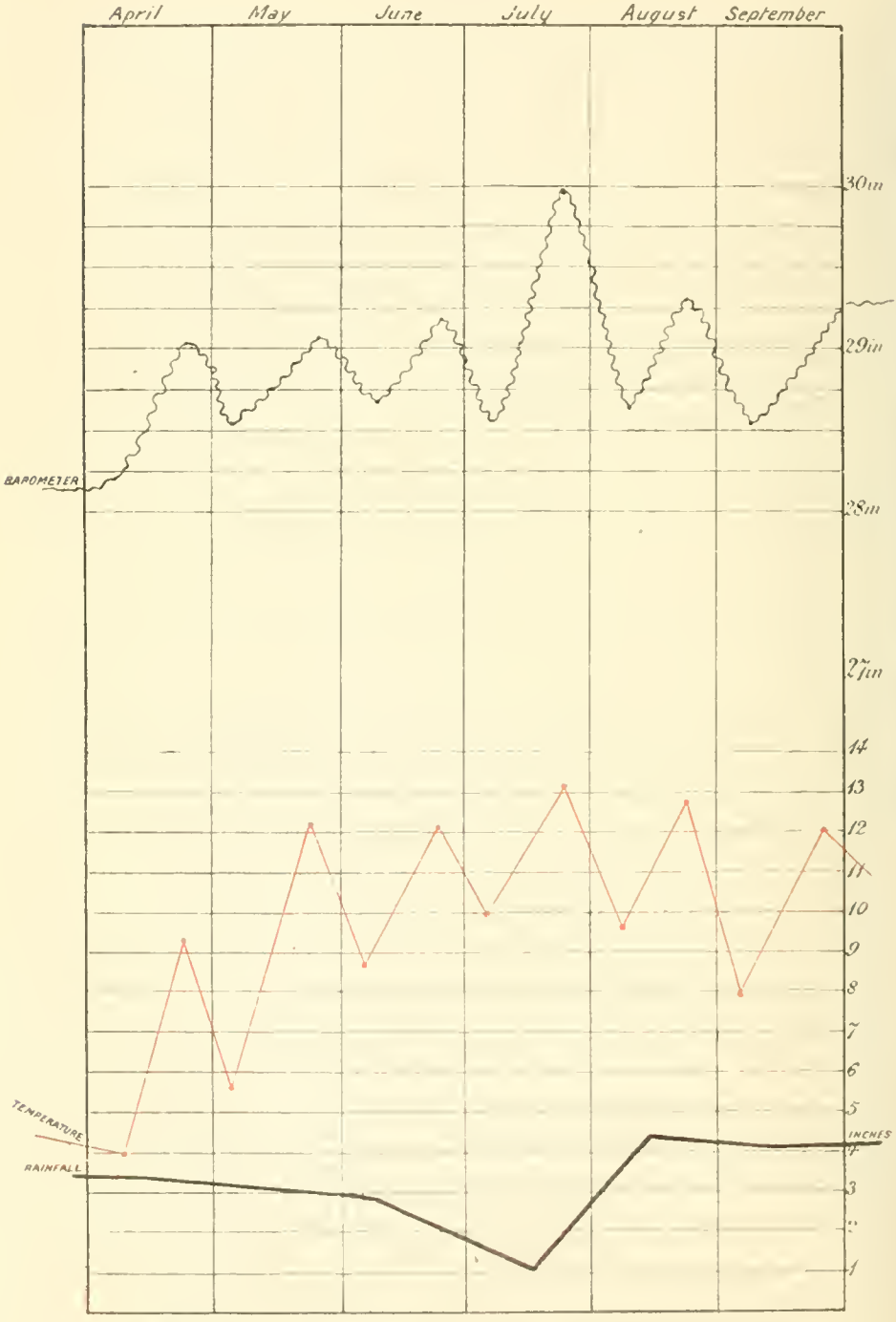
Rain, Temperature, and Atmospheric Pressure, during Season of Growth and Maturing, at the Ontario Experimental Farm.



NOTE.—The black bars show the days on which rain fell

Chart showing Barometric pressure Temperate and Rainfall during season of growth and maturing at The Ontario Experimental Farm

1880.



Temperature is calculated by 6° to each of the Rainfall inches

II.—THE FIELD.

1.—Farm Plan and Cropping.

In the accompanying plan fields A and C are the experimental plots; B, the paddock; D, the garden; and E, the College grounds. Part of E is now laid aside for an Arboretum, begun this year.

Fields 6, 12, 14, 16 and 17 require underdrainage to a considerable extent, and improved fencing is needed to as much as three miles at different places, over the whole. Reclamation from stumps and stones is rapidly proceeding in Nos. 6, 12, 14 and 15. Nos. 2, 5, 8, 11, 14 and 16 are still in the possession of the original stock of thistles, and even where root cultivation has been overtaken their eradication has not been satisfactory. Looking to an early and more complete riddance of this weed, we have begun a rotation of bare summer fallowing, which will have to be debited to future crops, and credit, or help, given as the work proceeds, because the soil does not require such manurial aid, nor can we recommend such a method of farming except in these circumstances. I would respectfully beg that all interested in our success would assist in withdrawing the risks of the re-seeding of this farm with thistles.

Succeeding the usual cropping abstract, I have pleasure this year in giving a full account of the cost of cultivation, the gross value realized, and the net profit obtained from each field. The management of the various crops will readily be understood from the items of expenditure.

Field No. 1.

Spring Wheat—White Russian, Lost Nation and White Fife varieties; 8 acres; average produce 15 bushels grain, and 3,000 lbs. straw. After potatoes and Indian corn fodder, manured with 15 loads farm-yard manure per acre.

Cost per acre:		
Fall ploughing		$1 50
Spring ploughing (gang)		0 75
Harrowing, twice		0 40
Seed		1 75
Seeding		0 25
Grass seeds		1 75
Rolling		0 20
Cutting thistles		0 50
Gathering stones		1 15
Harvesting		2 25
Threshing and preparing for market		1 10
		$11 60
Debit unexhausted manure (see chapter on "cost of producing crops")		8 00
Total cost		$19 60
Credit 15 bushels grain at $1.15	$17 25	
" 1½ ton straw at $6	9 00	
" 2 months' fall grazing	1 50	
		27 75
Net profit per acre		$8 15
Acres		8
		$65 20
12½ acres first year's pasture, less cost of cutting thistles		39 75
		$104 95

Field No. 2.

Second year's pasture ; 19 acres, two-thirds thistles.

Credit grazing part of season, $2 per acre		$38 00
Cost of machine mowing thistles	$9 00	
" Three ploughings, summer fallow, at $2 per acre for first and $1.50 for others	95 00	
		104 00
Total *debit* on field		$66 00

Field No. 3.

First years Hay, 22 acres ; 2¼ ton per acre on an average.

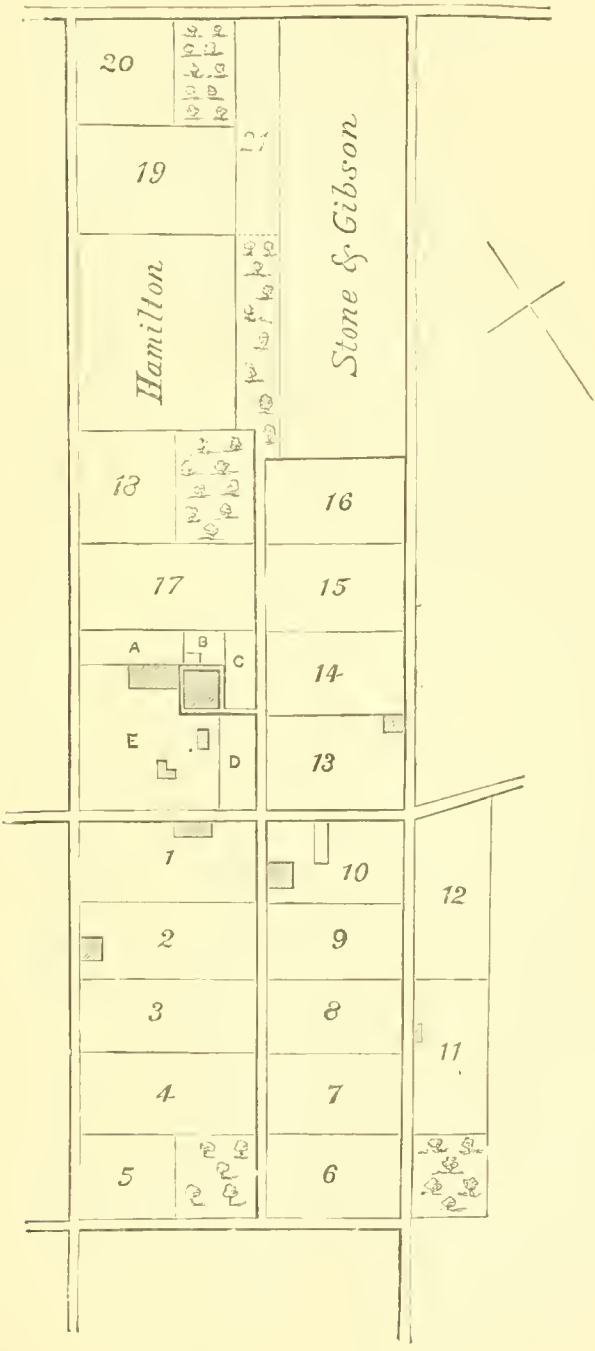
Rolling		$0 20
Gypsum, 200 lbs.		0 50
Cost of mowing, making and hauling		1 50
" Unexhausted manure		6 50
		$8 70
Value of 2¼ tons hay at $10		22 50
Hay profit per acre		$13 80
Value of after-grass at $1		1 00
		$14 80
Acres		22
		$325 60

Field No. 4.

7½ acres ; average produce, 170 bushels.

POTATOES—

Fall ploughing		$1 50
Spring ploughing (gang)		0 75
Grubbing, twice		1 00
Harrowing, "		0 40
Rolling, "		0 40
Manure, 15 loads farm-yard	$19 50	
Bone dust	2 70	
Salt	0 85	
Gypsum	1 06	
Superphosphate	3 30	
	$26 61	
Distributing manure	4 00	
	$30 61	
Credit 4-5ths of farm-yard manure, and ½ of specials, applied to following crop	20 50	
		10 11
Carried forward		$14 16


20
19
Hamilton
Stone & Gibson
18
16
17
15
A
B
C
14
E
D
13
1
10
12
2
9
3
8
11
4
7
5
6

Brought forward		$14 16
Drilling		0 75
Horse-hoeing, twice		1 00
Hand-hoeing „		4 50
Cost of seed and planting		5 50
Harvesting		5 50
		$31 41
Value of 170 bushels potatoes at 35c		59 50
		$28 09
Acres		7½
		$210 67

CARROTS—1½ acres; produce, 580 bushels per acre.

Cultivation and manuring, as above	$20 30	
Seed and seeding	1 15	
Harvesting	8 00	
		$29 45
Value of 580 bushels carrots at 15c		87 00
Per acre		$57 55
Acres		1½
		86 32

Field No. 5.

7½ acres Oats and 6 acres Barley, after Peas of 1879.

OATS—

Fall ploughing		$1 50
Gang ploughing (spring)		0 75
Harrowing, twice		0 40
Seed and seeding		2 00
Rolling		0 20
Harvesting		2 25
Threshing and preparing for market		1 25
Average of 4 loads farm-yard manure on poor knolls, at $1.30	$5 20	
Proportion for present crop		2 00
		$10 35
Value of 18 bushels oats at 35c	$6 30	
" 2,200 lbs. straw at $7 per ton	7 70	
		$14 00
		$3 65
Acres		7½
		$27 37

BARLEY—

Cultivation, manuring and harvesting, as above		$10 35	
Value of 21 bushels at 60c.....	$12 60		
" 2,000 lbs. straw	4 00		
		$16 60	
		$6 25	
Acres		6	
			$37 50
			$64 87

Field No. 6.

Summer-fallow, 12 acres.

Cost of two ploughings, at $2 (rough land)	$48 00
" Gathering stones, roots, etc.	12 00
Debit.....	$60 00

BARLEY—13 acres; 33 bushels grain and 3,000 lbs. straw, per acre, sown with grasses.

Fall ploughing			$1 50
Spring ploughing (gang)			0 75
Harrowing, twice...			0 40
Seed (barley).....			1 50
Seeding.....			0 25
Grass and clover seeds.....			1 75
Rolling			0 20
Harvesting			2 00
Threshing and preparing for market			1 10
			$9 45
Debit unexhausted manures			6 25
			$15 70
Credit 33 bushels grain at 60c.....	$19 80		
" 2,000 lbs. straw at $4 per ton	6 00		
" Fall grazing (light).....	1 50		
			26 30
Profit per acre			$10 60
Acres			13
			$137 80

Field No. 7.

Corn fodder, 8½ acres; Turnips, 12 acres.

CORN FODDER—

Fall ploughing	$1 50
Spring ploughing (gang)	0 75
Carried forward	$2 25

Brought forward		$2 25
Grubbing, once		1 00
Harrowing, once		0 20
Seed, 3 bushels		2 00
Seeding (drill)		0 25
Rolling		0 20
Harvesting (cutting with mower and shocking)		3 50
		$9 40
Manures:		
Bone dust	$5 40	
Salt	0 85	
Gypsum	1 20	
Superphosphate	6 60	
	$14 05	
Distributing manure	0 30	
	$14 35	
Credit ½ for future crops	7 17	
		7 18
		$16 58
Credit 22 tons green fodder at $1.50 per ton		33 00
Profit per acre		$16 42
Acres		8½
		$141 17

TURNIPS—(Swede) 12 acres.

Fall ploughing		$1 50
Spring ploughing (gang)		0 75
Grubbing		1 00
Harrowing, twice		0 40
Rolling, twice		0 40
Manures—Farm-yard, 15 loads	$19 50	
Bone dust, 300	4 00	
Salt, 250	0 50	
Gypsum, 200	0 50	
Superphosphate, 300	4 80	
	$29 30	
Distributing manure	4 00	
	$33 30	
Credit 4-5 farm-yard manure, and ½ of specials	23 00	
		10 30
Horse-hoeing, twice		1 00
Hand-hoeing, "		4 50
Drilling		0 75
Seed and seeding		1 15
Carried forward		$21 75

Brought forward		$21 75
Harvesting		8 50
		$30 25
Credit for extra cultivation, for future crops		2 50
Actual cost		$27 75
Value of 750 bushels turnips at 8c.		62 00
		$34 25
Credit leaves left on ground, said to be equal to what has been removed from the soil by bulbs		5 00
Profit per acre		$39 25
Acres		12
		$471 00
Brought forward		135 47
		$606 47

Field No. 8.

10 acres Fall Wheat (Clawson and Arnold's Victor), and 12¼ acres Spring Wheat (White Russian)

FALL WHEAT—

15 loads farm-yard manure	$19 50	
Credit 4-5 for future crops	14 50	
		$5 00
Fall ploughing		1 50
Seed and seeding		2 00
Harvesting		2 25
Threshing and preparing for market		1 25
		$12 00
Value of 27 bushels grain at $1	$27 00	
" 4,000 lbs straw at $5	10 00	
		37 00
Fall Wheat profit per acre		$25 00
Acres		10
		$250 00

SPRING WHEAT—

Fall ploughing	$1 50
Spring ploughing (gang)	0 75
Seed and Seeding	2 00
Harrowing	0 20
Rolling	0 20
Harvesting	2 25
Threshing and preparing for market	1 25
Carried forward	$8 15

Brought forward		$8 15
Credit 17 bushels grain at $1	$17 00	
" 1½ tons straw at $5	7 50	
		24 50
Spring Wheat, profit per acre		$16 35
Acres		12¼
		$200 28

Field No. 9.

11¼ acres White Russian Spring Wheat, and 10 acres of Experimental Cereals.

Fall ploughing		$1 50
Spring ploughing (gang)		0 75
Harrowing		0 20
Seed and seeding		2 00
Grass and clover seeds		1 75
Rolling		0 20
Harvesting		2 25
Threshing and preparing for market		1 25
		$9 90
Debit half of unexhausted manure given in previous root crops		11 50
Cost per acre		$21 40
Value of 22 bushels grain at $1	$22 00	
" 2 tons straw at $7	14 00	
" Fall grazing	1 00	
		37 00
Profit per acre		$15 60
Acres		11¼
		$171 60
Value of 10 acres rented to Experimental Department		35 00
		$206 60

Field No. 10.

Second year's Hay, 15¼, and Potatoes, 5 acres.

Gathering stones, per acre		$0 30
Rolling		0 20
Mowing, making and housing		1 50
		$2 00
Unexhausted manures given four years ago		3 00
Cost per acre		$5 00
Value of 2 tons hay, at $10	$20 00	
" Fall grazing	1 25	
		21 25
Profit per acre		$16 25
Acres		15¼
Carried forward		$262 81

Brought forward	$262 81
POTATOES—	
See details in No. 4 Field, but adding extra cost of cultivating in hills, and less produce per acre by reason of place taken up with new orchard trees, and no manure, being in sod	205 00
	$467 81

Field No. 11.

Second year's pasture; 21¼ acres.

Credit grazing 10 cattle at $1.50 per month, for six months		$90 00
Cost of cutting thistles	$3 00	
" Unexhausted manures given five years ago	41 50	
		44 50
		$45 50

Field No. 12.

Uncultivated pasture, surface drained; 18½ acres.

Grazing valued at $1 per acre	$18 50
Cutting thistles	2 00
	$16 50

Field No. 13.

Second year's Hay; 23 acres, 2⅛ tons per acre.

Gypsum, 200 lbs	$0 50
Mowing, making and hauling	1 30
Unexhausted manures	3 00
	$4 80
Value of 2⅛ tons hay at $10	21 20
	$16 40
Value of fall pasture	1 30
	$17 70
Acres	23
	$407 10

Field No. 14.

First years' Hay; 23 acres: unreclaimed and wet, 3 acres.

Gypsum, 200 lbs. per acre	$0 50
Mowing, making and housing	1 30
Unexhausted manures	6 50
Carried forward	$8 30

Brought forward	$8 30
Value of 2¼ tons hay at $10	22 50
	$14 20
Value of fall pasture	1 20
Profit per acre	$15 40
Acres	23
	$354 20

Field No. 15.

21½ acres—3½ acres uncultivated; 1 acre Tare and Oat Fodder, 14 acres Oats, and 4 acres Peas.

TARE AND OAT FODDER—

Fall ploughing	$1 50
Spring ploughing (new land)	1 50
Harrowing	0 20
Seed and drilling same	3 45
Cutting	2 50
	$7 15
Credit 5 tons green fodder	30 00
	$22 85

OATS—

Fall ploughing		$1 50
Spring ploughing (gang)		1 50
Harrowing, twice		0 40
Seed and seeding		2 00
Rolling		0 20
Harrowing		2 25
Hauling and preparing for market		1 25
		$9 10
Value of 28 bushels grain at 35c	$9 80	
" 1¾ tons straw at $6	10 50	
		20 30
		$11 20
Acres		14
		$167 50

PEAS—

Fall ploughing	$1 50
Spring ploughing (gang)	0 75
Harrowing	0 20
Seed and seeding	1 45
Harvesting	1 75
Carried forward	$5 65

Brought forward		$5 67
Value of 26 bushels peas at 60c.	$15 60	
" 1¼ tons straw at $5	6 50	
		22 10
		$16 45
Acres		4
		$65 80

Field No. 16.

3 acres Peas; 7 acres pasture and bare fallow; Oats, 7 acres; 4¼ acres uncultivated; 1 acre wet.

OATS—

Spring ploughing, sod		$2 00
Seed and seeding		2 20
Harrowing, twice		0 40
Rolling		0 20
Harvesting		2 25
Threshing and preparing for market		1 25
		$8 30
Value of 15 bushels grain at 35c.	$5 25	
" 1 ton straw at $6	6 00	
		11 25
		$2 95
Acres		7
		$20 65

PEAS—

Spring ploughing, sod	$2 00	
Seed and seeding	1 50	
Harrowing, thrice	0 60	
Harvesting	1 75	
	$5 85	
Value of 30 bushels grain at 60c.	$18 00	
" 1½ tons straw at $5	7 50	
	25 50	
	$19 65	
Acres	3	
		58 95
		$79 60

Field No. 17.

10 acres Mangolds; 10 acres Turnips.

MANGOLDS—

Debit as detailed in Field No. 7	$27 75
Value of 790 bushels at 10 cents	79 00
Carried forward	$51 25

Brought forward		$51 25
Acres		10
		$512 50

TURNIPS—

Debit as in No. 7	$27 75	
Value of 675 bushels at 8 cents	54 00	
	$26 25	
Acres	10	
		262 50
		$775 00
Credit leaves left on ground, 20 acres at $5		100 00
		$875 00

Field No. 18.

12 acres first year pasture; 7 acres uncultivated pasture.

PASTURE—

(1st year) 12 acres; 1 cattle beast for every 1½ acres, at $1.50 per month	$72 00
Debit unexhausted manures from roots, 3 years ago, at $5.50 per acre	66 00
	$6 00
Uncultivated pasture, very old and good, 7 acres at $2	14 00
	$20 00

Field No. 19.

Oats, 14 acres; Peas, 16 acres; after old pasture.

OATS—

Debit as detailed in No. 16 Field		$8 30
Value of 10 bushels grain at 35c	$3 50	
" 1½ ton straw at $6	9 00	
		12 50
		$4 20
Acres		14
		$58 80

PEAS—

Debit as detailed in No. 16 Field	$5 85	
Value of 25 bushels grain at 60c	$15 00	
" 1½ ton straw at $5	7 50	
		22 50
	$16 65	
Acres	16	
		266 40
		$325 20

Field No. 20.

11 acres very old uncultivated pasture, worth $15 00

Field No. 21.

16½ acres, third year's Hay.

Mowing, making and stacking 12 tons	$30 00
Value of 12 tons Hay	120 00
	$90 00
Value of fall grazing	15 00
	$105 00

2.—Cropping Results, 1880.

Field.	CROPS.	Acres.	Quantity Harvested.	Gross Expense of Production.	Gross Receipts.	Profit or Loss.	Profit per B. or T.	Profit per acre.
				$ c.	$ c.	$ c.	$ c.	$ c.
1	Spring Wheat	8	120 B.	156 40	222 00	65 20	0 52	8 15
"	Pasture, 2nd year	12½	.....	.....	319 75	39 75	.....	3 50
2	2nd year Pasture	19	.....	104 00	38 00	-66 00	.....	3 50
3	1st-year Hay	22	49½ T.	191 40	517 00	326 60	6 50	15 00
4	Potatoes	7½	1275 B.	235 57	446 25	210 68	18 17	28 00
"	Carrots	1½	870 "	244 17	130 50	86 33	0 10	57 00
5	Oats	7½	135 "	77 62	105 00	27 38	0 20	3 70
"	Barley	6	126 "	62 10	99 60	37 50	0 29	6 25
6	Bare Fallow	12	.....	60 00	.....	-60 00	.....	-5 00
"	Barley	13	429 B.	204 10	341 90	137 80	0 32	10 60
7	Corn Fodder	8½	22 T.	140 93	280 50	141 17	6 65	17 00
"	Turnips	12	9300 B.	333 00	804 00	471 00	0 05	39 25
8	Fall Wheat	10	270 "	120 00	370 00	250 00	0 93	25 00
"	Spring Wheat	12¼	208 "	99 84	300 12	200 28	0 96	16 00
9	Spring Wheat	11¼	253 "	246 10	425 50	206 60	0 82	18 40
"	Rented to Experimental	10	.....	.....	35 00	35 00	.....	3 50
10	Hay, 2nd year	15¼	30½ T.	76 25	324 06	247 81	8 10	16 25
"	Potatoes, part Orchard	5	750 B.	40 00	245 00	205 00	0 33	41 00
11	Pasture, 2nd year	21½	.....	44 50	90 00	45 50	.....	2 14
12	Pasture, uncultivated	18½	.....	2 00	18 50	16 50	.....	0 90
13	Hay, 2nd year	23	48¾ T.	110 40	517 50	407 10	8 40	17 70
14	Hay, 1st year	23	51½ "	190 90	544 10	354 20	6 80	15 40
15	Tares and Oats	1	5 "	7 15	30 00	23 85	4 75	23 85
"	Oats	14	392 B.	127 40	284 20	157 50	0 40	11 25
"	Peas	4	104 "	22 60	88 40	65 80	0 62	16 45
16	Oats	7	105 "	58 10	78 75	20 65	0 20	3 00
"	Peas	3	99 "	17 55	76 50	58 95	0 65	19 65
"	Pasture	8	See details					
17	Mangolds	10	7900 B.	277 50	790 00	512 50	0 06½	51 25
"	Turnips	10	6750 "	277 50	540 00	262 50	0 04	26 25
18	Pasture, 2nd year, and old	19	.....	66 00	86 00	20 00	.....	1 05
19	Oats	14	140 B.	116 20	175 70	59 50	0 42	4 25
"	Peas	16	400 "	93 60	360 00	266 40	0 66	16 60
20	Pasture, uncultivated	11	.....	.....	15 00	.....	.....	1 35
21	Hay, 3rd year	16½	12 T.	30 00	135 00	105 00	8 75	6 40

B. for Bushels; T. for Tons.

Abstract of Average Results of 1880 Cropping.

CROP.	Cost per Bushel or Ton.	Cost per Acre.	Value per Acre.	Profit per Bushel or Ton.	Profit per Acre.
	c.	$ c.	$ c.	$ c.	$ c.
Fall Wheat	00 45	12 00	37 00	00 93	25 00
Spring Wheat	00 86	30 00	15 00	00 77	14 00
Hay	3 16	6 00	20 00	7 60	16 00
Oats	00 49	9 00	15 00	00 30	5 50
Barley	00 48	14 00	23 00	00 30	8 42
Peas	00 24	4 30	13 00	00 64	17 50
Potatoes	00 13	22 00	55 00	00 25	34 00
Carrots	00 27	16 00	87 00	00 10	57 00
Turnips	00 37	28 00	61 00	00 04½	33 00
Mangolds	00 35	28 00	79 00	00 06½	51 00

3.—Discussion of Results of Farm Cropping.

With reference to this table of cropping results of season 1880 from 400 acres, I beg first of all, to draw attention to the difference between it and that on the like subject under the heading of "The Cost of Producing Crops," herewith. The latter is the mean of several years from the same farm, and only the principal field crops thereof, which necessarily gives a higher average; the other is the showing of but one year, and includes all kinds of crops, pasture, and such like, along with the losses, and bare fallowing, so that, if 1880 was an average season as a whole, the general mean will be a better criterion of what profits can be realized from land under systematic rotation, as in our circumstances. As I place considerable value on this mode of exhibiting a farmer's income, some explanation of the details will not be out of place.

On a farm of 400 acres, rotating with peas, wheat, oats, roots, hay, pasture, and bare fallow, and where much farm-yard manure, with special fertilizers, is applied only to the root division in a seven years' course, the average net profit in such a season as 1880 seems to be $12.50 per acre.

Were we in England, as tenants, the disposal of this would take the shape of:—*One* for the proprietor, *one* for farm maintenance, and *one* for the farmer, or $4.17 each; but the Canadian farmer being in much more independent circumstances, has only to think of his own household and up-keep of his own property. As explained in the other chapter on this subject, interest on invested capital is not necessarily an item forming a debit upon this $12.50, for the reasons stated, and thus we have, as it were, *four* rents on hand in place of the Englishman's three. Of course we are to handle this profit without reference to its further disposal to live stock and household keep, which ought to draw increased profits, and which will be discussed on another occasion. This revenue then of $4,800 in the lands of an ordinary farmer may thus be apportioned:

Paid labour	$1,000
General repairs	250
Keep of live stock	1,500
Seed and special manures	250
Household keep	1,000
Taxes	80
Incidentals	200
	$4,280

Which balance of $520 may be called a clean bank deposit ready for any purpose.

But, it is interesting to note how profits vary with different crops, depending (1) upon the stage in the rotation as affected by value, or proportion, of unexhausted manures, (2) by the individual market importance of the crops, and (3) by preparing for succeeding crops. Wheat, with straw, at 15 bushels per acre, upon land recently manured, gives a profit of no less than $1.25 per bushel, because it is debited with only one-fourth of these manures, while wheat of the same kind producing as much as 22 bushels per acre, gives only 82 cents per bushel of profit by reason of getting the immediate benefit of all cultivation and manuring. Under a variety of conditions, you will observe that Wheat —fall and spring varieties—gives a profit of 99 cents per bushel, which means that in selling his wheat at $1 per bushel, the transaction is all profit—it has left no debt behind. The average profit on oats is 31 cents per bushel, even with the very low produce of 18 bushels per acre. Our oat divisions this season were very exceptional, as evidenced by the fact, on another page, that our mean for five years has been 41 bushels per acre. Barley this year was also somewhat under our average of 30 bushels per acre; but even with 27 bushels, the profit is but the half of its market value, 30 cents as against 60. If this be correct of barley in all cases, one-half of the selling price should be brought back to the farm. Peas take the same position as wheat and oats in this respect. Including under the term roots—mangolds, turnips, carrots, and potatoes, we obtain an average profit of 8¼ cents per bushel of sixty pounds; this agrees very closely with what we have been charging our cattle and sheep with such keep, and is also in agreement with the rate of their progress when fed with these roots, as shown in previous reports. When Hay is put on the market at $10 per ton, $2.50 have to be taken home to square up accounts—the mean profit being $7.50. In order of profit per acre, I have to submit the following list:

Carrots	$57 00
Mangolds	51 00
Potatoes	41 00
Turnips	33 00
Fall Wheat	25 00
Tare and Oat Fodder	23 85
Spring Wheat	17 70
Corn Fodder	17 00
Hay	14 15
Pasture (crop only)	2 35

These make a mean of $28 per acre, but of course do not include bare fallowing and losses, as shown in Fields 2 and 6, along with the uncultivatd portions.

4.—The Cost of Producing Crops During the Last Five Years.

We should now be able to say something in regard to the cost of producing certain crops under a given system of rotation, upon certain soils, by special management, during a series of years. To do this reliably, requires careful figuring, and a sound handling of the facts that now guide the science and practice of our profession, especially with reference to the conduct of plants and their food as regulated by weather, soil, and management. There can be no more unsound method of arriving at this than the common one of debiting—cultivation, seed, manuring, and cost of harvesting and marketing, and then crediting the realized quantity of crop. The only case in which such a method can be reasonably applied is that of cropping upon virgin land which is insensibly impoverished during a number of years, and which requires no form of manuring; but even in this example, the economist must recognise the fact that the soil does diminish in power. We have, however, to deal with land that has been regularly cultivated for the past twenty years at least—land therefore now regularly yoked to systeinatic rotation of crops, and supposed to be representative of the older cultivated lands of Ontario, both as regards physical condition, natural richness, and modes of cultivation.

The first thing is to show the rotation and tabulate the average quantity of crops from a number of fields during the last five years, as recorded in previous annual reports:

Rotation of Cropping Adopted on the Ontario Experimental Farm.

1st year—Peas.
2nd " —Fall Wheat or Oats.
3rd " —Roots—manured.
4th " —Barley or Wheat (seeded with grasses and clovers).
5th " —Hay.
6th " —Pasture or Hay.
7th " —Pasture.

AVERAGE PRODUCE PER ACRE PER ANNUM FROM 1876 TO 1880 INCLUSIVE.

——	1876.	1877.	1878.	1879.	1880.	Average Produce per Acre.
Peas	30	24	31	32	35	30 Bushels.
Spring Wheat	10	18	14	20	22	17 "
Fall Wheat	34	30	32	21	37	31 "
Oats	40	35	48	36	45	41 "
Mangolds	360	765	1030	718	750	725 "
Turnips	521	766	554	630	600	614 "
Carrots	284	610	910	315	580	540 "
Potatoes	128	150	250	77	220	165 "
Barley	30	35	27	36	30	32 "
Hay	1⅓	1⅛	2½	1 3-5	2¾	1 4-5 tons.

Let us now explain the plan by which I propose to arrive at the cost of producing each of these six varieties of crops. By the rotation, all the manure allowed for the seven years, is given with the root division, and should be such as to supply all that is needed for the various crops of that period. In charging the turnips, mangolds, carrots and potatoes with the item of manure, therefore, it is plain that the whole bill is not theirs, but must be apportioned according to what experiment has shown to be the average feeding volume of each, proportionately to time, soil, season, and management thereof. If there be any residue of manurial value, or what may be called increased value of land from such management on the expiry of the seventh year—or when the wheat and oats are removed—the same should be considered in the future balance sheet, either in taking inventory of capital account (original investment in purchase of land) or increasing the credit of the coming succession of crops. I am not prepared to allow directly for superior brain work in the management of a farm, because I am not prepared to leave the management of a farm to brains alone, so if it should be argued that any of these crops should be debited with such superior management, I beg to note that the general result will embrace this in the septennial balance sheet by the inventory indicated. Credit must also be allowed the root division for the extra cultivation and cleaning of the land, the same being so much more *manure* in a different form.

Our task is now therefore very simple, and shall naturally begin with the root division, it being understood that in all examples allowance is made for tear and wear of implements.

A general table of cost of operations will conveniently precede.

Cost of Work on Various Farm Crops, Per Acre.

Common ploughing of stubble	$1 50
" " sod	2 00
Gang ploughing	0 75
Harrowing, one time	0 20
Cultivating, once	1 00
Rolling, once	0 20
Horse-hoeing, once	0 50
Hand-hoeing, once (average)	2 25
Drilling, with single plough	0 75
Root sowing, drill	0 35
Grain sowing, drill	0 25
Hauling and spreading farm-yard manure, 15 loads	3 75
Sowing artificial manures	0 25
Harvesting Wheat, Oats, or Barley, including mowing, binding, shocking, and hauling	2 25
Harvesting Peas, pulling and hauling	1 75
Topping, harrowing, and hauling Mangolds and Turnips	8 50
Pulling, topping and hauling Carrots	8 00
Ploughing, gathering and hauling Potatoes	5 50

Cost of producing Roots per acre.

Fall ploughing, once		$1 50
Spring ploughing, gang, once		0 75
Grubbing, twice		1 00
Harrowing, twice		0 40
Rolling, twice		0 50
		$4 05
Manure:—Farm Yard, 15 loads	$19 50	
Bone Dust, 300 lbs.	4 00	
Salt, 200 lbs.	0 50	
Gypsum, 200 lbs.	0 50	
M. Superphosphate, 300 lbs.	4 80	
Distributing Manures	4 00	
		33 30
Horse-hoeing, twice	$1 00	
Hand-hoeing	4 50	
Drilling	0 75	
Cost of seed and seeding	1 15	
Harvesting	8 50	
		15 90
Total cost		$53 25
Credit ⅓ of unexhausted Farm Yard Manure	$15 60	
" ½ of Special Manures	6 90	
" allowance for extra cultivation, etc.	4 50	
" half cost of distributing	2 00	
		29 00
Actual cost of producing one acre of Mangolds and Carrots		$24 25
Value of average crop of these roots, 670 bushels at 9c		60 30
Profit per acre		$36 05
Credit tops and leaves left on land—said to be equal to what has been removed from the soil, say		5 00
		$41 05

Cost of producing Grain Crops (Wheat, Oats, Barley) per acre.

WHEAT—

Fall ploughing		$1 50
Gang ploughing		0 75
Harrowing		0 40
Seed, $1.75; and Seeding, 25c		2 00
Rolling		0 20
Harvesting		2 25
Threshing and preparing for market		1 25
		$8 35
Debit value of Manures, half of residue		12 50
Total cost		$20 85
Value of average crop of 24 bushels Wheat at $1.15	$27 60	
" 1½ ton straw at $5	7 50	
		35 10
Wheat profit per acre		$14 25

OATS—

Debit work as above for Wheat		$8 35
" ⅓ proportion of Manure residue		8 33
Total cost		$16 68
Value of average crop of 41 bushels, 40c. per bushel	$16 40	
" 2 tons straw	12 00	
		28 40
Oat profit per acre		$11 72

BARLEY—

Debit work as above for Wheat		$8 35
" ¼ proportion of Manure residue		6 25
Total cost		$14 60
Value of average crop of 32 bushels Barley at 60c	$19 20	
" 1 ton straw	3 50	
		22 70
Barley profit per acre		$8 10

HAY—

Mowing, making and hauling	$1 50
Debit unexhausted Manures	6 50
Total cost	$8 00
Value of 1⅓ ton Hay at $10	18 00
Hay profit per acre	$10 00

Potatoes—	
Cost of cultivation as in other root crops	$48 86
" harvesting	5 50
	$54 36
Credit unexhausted Manures	25 00
Total actual cost	$29 36
Value of average crop of 165 bushels Potatoes at 35c.	57 75
Potato profit per acre	$28 39
Carrots—	
Cost of cultivation as for Mangolds and Turnips	$48 86
" harvesting	8 00
	$56 86
Credit Manures unexhausted, etc	25 00
Actual cost	$31 86
Value of average crop of 540 bushels	81 00
Carrot profit per acre	$49 14
Peas—	
Ploughing sod	$2 00
Seed and sowing	1 50
Harvesting	1 75
	$5 25
Unexhausted Manures	3 00
Total cost	$8 25
Value of 30 bushels Peas at 60c. $18 00	
" 1½ ton straw at $5 7 50	
	25 50
Pea profit	$17 25

Abstract of Cost, Produce, and Profit, per Acre.

	Cost.	Produce.	Profit.
	$ c.	$ c.	$ c.
Mangolds and Turnips	24 25	60 30	36 05
Wheat	20 85	35 10	14 25
Oats	16 68	26 35	9 67
Barley	14 60	20 80	9 70
Hay	8 00	18 00	10 00
Peas	8 25	25 50	17 25
Carrots	31 86	81 00	49 14
Potatoes	29 36	57 75	28 39
Means	$19 23	$40 60	$21 81

In the case of growing mangolds and turnips, fully one-half the cost of establishing them lies in the value of the manure, and one-seventh of the whole cost consists in harvesting. The total value of the crop is equal almost exactly to the gross cost of production when unexhausted manures are not credited, and when these are credited the actual cost is reduced one-half, so that we have a net profit nearly equal to this *bona fide* cost. With other roots the facts are the same, but a very high figure in favour of carrots.

With grain proper we have :

——	First Cost.	Gross Cost.	Value of Produce.	Profit with First Cost.	Profit with Gross Cost.
	$ c.	$ c.	$ c.	$ c.	$ c.
Wheat	8 35	20 85	35 10	26 75	14 25
Oats	8 35	16 68	26 35	20 05	11 72
Barley	8 35	14 60	20 80	14 35	8 10
Means	$8 35	$17 38	$27 41	$20 38	$11 36

So that were we not to charge the succeeding crops after roots with part of the value of the manures, the profits would be nearly double in the case of Wheat, Oats and Barley—from $11.36 to $20.38. But we shall discuss the subject from its whole course of a rotation and the mean of the results of each class of crops, and not from a particular crop. From the Abstract it appears that the actual profits from one acre over seven years by ten kinds of crops is $20.38, and that it costs $17.38 to produce this profit, or say nearly dollar for dollar.

What then is the application of this supposed profit of $20.38 per acre? In the first place it is the natural outcome of the sum of $75 originally invested in land, implements and horses, and consequently of the use of labour, implements, horses, manures, seed and skill. We have already debited all these, with the exception of the latter, so that all we have to do is to distribute this profit of $20.38. When the regular accountant begins by debiting "interest on original investment," and follows with the various charges we have already handled, I am unable to see why it should form an actual item in such a form, because the total result, whether of profit or loss, is just the interest, or no interest, upon the original investment, and in our case of producing crops, may not be all the profit or loss in the management of a farm, as the producer, being also the owner and feeder of the live stock thereof, has to run another line of chances when transferring these crops to the various animals, whether for labour, milk, beef, mutton, wool or pork, or taxes and household maintenance; he does not pay rent or interest on capital, and thus altogether the farmer is now in possession of crops valuing in the market an average of $20.38 per acre with which to make further investment as indicated

III.—THE LIVE STOCK.

We should never rest satisfied until the Province produces a 1,500 lb. steer for every ten acres of its cultivated surface, along, of course, with the proper modicum of wheat. To do this well, in every respect up to the present times, and even anticipatory in some things, should be the duty and pride of all our yeomen. It is now a matter of fact that they are aiming at this pretty thoroughly, but it is with a much larger measure of the "probable effects and consequences" in their eye than many of us like to discuss calmly. Ontario, after all, is not so American as England would make it, and certainly is less

speculative than the one, and as cautious as the other. We are in the enviable position of being able to maintain herds and flocks vastly superior in health to either Britain or the States, and at less cost than the former, and more certainty of up-keeping the characteristics of various breeds than the latter. While for many years we will have to bow to the Americans in regard to the number of cattle per country, we never will, nor do we now, have to do so per hundred acres of arable land, or *per capita* of the population. So also, just as much as we are in advance of England for cheap production, we are ahead of our neighbours in quality of material produced. With all these important facts in our favour, the world is naturally looking for some more energy, and some more capital in this big field of our profession.

Believing that a good story will stand more than one telling, and that many of our farmers are still but indifferently well up in what guides us in the selection of cattle beasts for beefing purposes, I beg their acceptance of the following as my own likings in the particular line of steer feeding.

I am of opinion there is too much a seeking after size of frame than is desirable for rapidity, economy, and quality of growth of flesh. Bone weighs well, of course, particularly when it is coarse, but it takes longer to cover the field, more money to do it per square foot—if it ever does it—by reason of the coarsenesss in question. Commend me to the average sized animal with a tendency to fineness all over, no roughness anywhere, no big hooks, and certainly no big head. I am such a believer in a certain head, that, given the head I want, I would chance what is behind it in the majority of cases. Have the mouth and lips rather large proportionately, with a distinct concave to the top of the muzzle that joins the beginning of the face proper. I do not care if there be even a slight dishing from the line between the nostrils half way up the bridge, and almost a distinct jump of the same kind on each side immediately above the nostrils; we must have these parts clean and yet giving room enough for breathing. The wedgy face from the muzzle to the eyes must be distinct as such; that is without being rounded on to the cheek or laid with any prominence of muscle or flesh where it drops to the cheek, and the thin end of the wedge must be a wedge and not a club. Good depth of cheek or jaw bone is advisable, both for eating and breathing. Have a clean jaw, little muscle and no flesh to speak of. Avoid close set, small, sunken eyes in every case; the prominent large calm eye, but yet with a spark of liveliness, is the best one for our purpose; a clean broadish rim round the eye, or at best with but few hairs, and then a gradual lengthening of thick hair all round, with a decided looseness of skin, is my fancy for the eye of a good feeder. The lash should be long, but not thick necessarily. Above the eye line, the head should not only scoop to the horns, but stand somewhat narrower, have a thick mat of soft hair with a tendency to curl, and rather long than very short. A concave face is better than a dished one, when we speak of beef as against milk, and at present I am only upon beef. The difference is quite distinct, and without elaborating meantime it will suffice to note that a dish will hold water, while a concave won't. There is as much objection to a short as a long distance between the eye and the horn—the one savours of meanness, want of intelligence, and a corresponding type everywhere else, the other betokens a coarseness, and a little more *dourness* when accompanied with a sunken eye. A rather prominent poll (which has no connection with length from eye to horn) is a good point—with or without horns, —as being the cope stone or crown to our beefing head. And then, the horn? In a state of nature, it is a good weapon and a thing of beauty; to our ox it is much as you wish it. Its flatness and strength is lost in the altered male, but it can be made more or less so by timing the alteration, and altogether bred out if desired. A medium horn, as regards strength, is a safe criterion of pliability of character so far as it goes. I am of opinion there is more in the ear than the horn. It should be slightly attached, and rather bare of hair at the attachment to the head, but the hair must be profuse, silky and long all over the inside and out to the edge, with nothing behind but what is found on the neck. Flabbyness and a blunt point is not allowable, though a fair breadth is well liked, and in every case demand thinness without delicacy.

Such then is my *beau ideal* of the head of a splendid beefing steer. It can be contended that every point in such a head represents a characteristic throughout the frame. The open nostril tells of heart and girth; the large lips of a long, roomy, deep barrel; the

wide forehead and placid eye of good loins and corresponding hindquarters; and the ear (assisted by the horn, it may be) of a fine bone throughout. I repeat that were such a head sent to any student of this line of judging, he would, to 80 per cent., tell what the frame was, and getting the tail in addition, he should almost complete the description.

The model neck is full on the sides, tucking in and up sharply below to the throat, where a moderate amount of loose skin is better than much of it. There is a grand, firm, silky mellow handling here, difficult to describe—no flabbyness, but a curly crispness of skin and hair that fitly underlies and forms the prow of the vessel so nobly headed, as we have just seen. The neck top is fine, not too flat nor narrow, the back-half level with all the top line of the body, and the forepart drooping somewhat to the head. A clean, fine joining of neck and head is always best. Neck and shoulders join easily but not necessarily unseen in the store animal. I have no particular liking to the very deep forward brisket, perpendicular from the joining of neck and chest; no doubt it fills up the rectangular frame so much loved by the older breeders, but just as it is easy to give a ship or a plough too much dip, so our feeding steer can have too much forward keel, something in the way of its easy grazing, and at the same time portending a sluggish disposition. An important point in the get-up of the forequarters is the space between the tops of the shoulders; in many cases there is too much width here—space which the spine does not fully take up, and therefore making a looseness that affects other parts—giving no more flesh-carrying area when the chest is otherwise right. I do not wish to be thought as advocating narrow shoulders at any point, or a contracted chest—much the reverse, but bad packing of parts as between these and the spine and crops is certainly objectionable. The shoulder itself, from top to point and from point to arm should not be flat nor too perpendicular; the shoulder blade must be more of the bridge than of the tie type, in fact it should be both, tying the chest, spine and crops together, and standing as a bridge to resist weight in the case of draught, and keep the forequarters from overloading or pressing upon those behind. A fair or medium slope is better than the upright form of shoulder, because of inducing sluggishness and an awkward grazing animal. The top of the fore arm should be part and parcel of the shoulder, full and even with it in every respect, the beef coming well down, but yet not encumbering the knee, and there consisting of muscle. A rather large, flat but clean knee is the best, with a fine, clean leg and medium hoofs, not flat nor narrow. As in the case of the shoulder top with the spine, it is not good to have much space between the elbow and girth, or such a width as horsemen like, but a nice even agreement of chest, arm and girth—fulness without looseness.

And now what shall we say of the prominent Shorthorn weakness—the slack crops? It may be asked why is this the case in all beefing breeds that have been, so to speak, *made by man?* Besides the Shorthorn it is rather characteristic of the Aberdeen Polls and the improved Longhorn of England, while it is not so much so of any of the comparatively original breeds, such as the Herefords, Devons, Sussex, Irish and Argyleshire. Shall we conclude that man's interference has contracted the space between heart and barrel, or is it but an external defection consequent on a superior shoulder and better sprung mid-rib? We all like it full at any rate, which implies, I think, a well sprung fore-rib. The girth should be told by a broad, strong spine, full crops and a deep round fore-flank and chest. All the ribs should spring, arch and lengthen well down. There is also no doubt of the value of the hinder ribs and hooks keeping close acquaintance for our present purpose, and they also regulate the flank and plate spaces. It is not only possible but very common to have too wide loins and very rough hooks; such a style of hindquarters often gives a wedgy rump and apparently narrow hams. No doubt, the accompaniment of such forequarters and barrel, as we have sketched, is a corresponding loin, and it is more the case that the hocks are much too large—unnecessarily large—than that the loins are disproportionate to any part of the body. The loins themselves should be slightly arched to ensure strength, secure the long hind-quarters, the rump proper, therefore, being about equal to the length of the barrel; a slightly drooping rump, well filled, is preferable to dished ones with a high standing tail. Width at the pin-bones, or tail attachment, is very important—carrying out the corresponding style of loin and rump, and enabling beef to be carried broad and deep towards the hocks. We must have a deep full twist, going well fore-and-aft, and not afraid of encumbering the hocks. Choose the hind leg of a horse

for the hind leg of a beefing steer—straight, clean and not in-kneed. Never neglect a fine tail without much hair, and strongly attached to the body. The full prominent purse is an indication of strength of constitution, of sappyness, and of a good doer. I am no believer in colour of hair, except as a matter of fancy, but I think that a milk-giving colour of skin is a beefing one also. A thick crop of fine, soft silky hair is evidence of good soil and sub-soil. I am almost a follower of him who, with shut eyes, will *handle* and pronounce judgement on *quality*. Quality is the concentrated essence of all the virtues of blood and breeding as exhibited in hair, skin, and surface flesh, and is a long big study of itself.

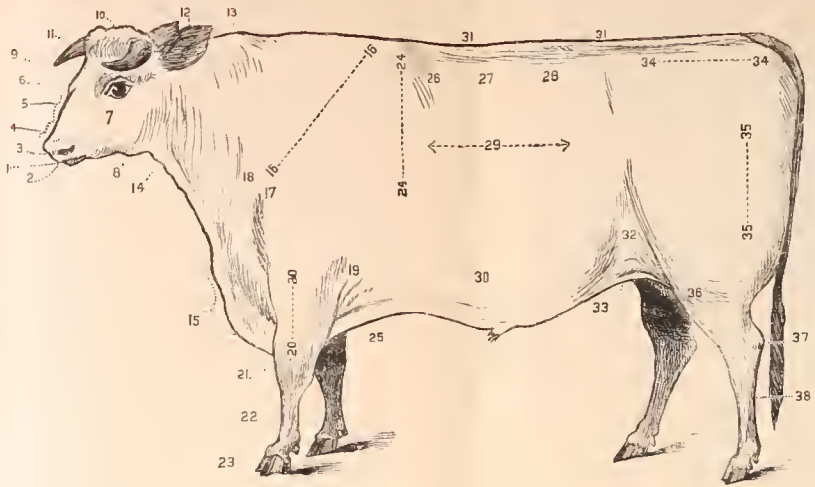
2.—Public Sale of Surplus Live Stock, 10th September, 1880.

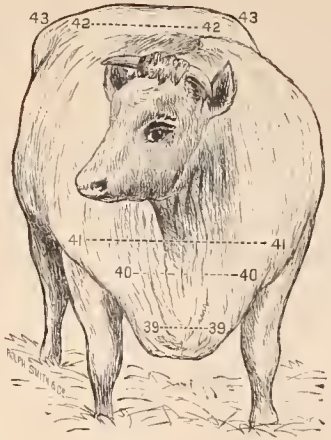
Lot.	CLASS.	PURCHASER.	Amount.	Total.
	CATTLE.			
	Shorthorns.		$ c.	$ c.
1	Heifer Calf	John Nelson, Orillia, Simcoe	63 00	
2	do	W. R. Motherwell, Perth, Lanark	71 00	
3	Bull Calf	J. R. Bullock, Hopetown, Lanark	93 00	
				227 00
	Aberdeen Polls.			
4	Yearling Heifer	James Glennie, Guelph, Wellington	87 00	
5	Bull Calf	John Rae, West Winchester, Dundas	50 00	
				137 00
	Ayrshires.			
6	Heifer Calf	Benjamin Storey, Picton, Prince Edward.	69 00	
7	do	H. Glazebrook, Simcoe, Norfolk	66 00	
8	Bull Calf	Benjamin Storey, Picton, Prince Edward.	71 00	
				206 00
	SHEEP.			$570 00
	Cotswolds.			
1	Shearling Ram	William Hunter, Underwood, Bruce	40 00	
2	do	C. V. F. Bliss, Ottawa, Carleton	38 00	
3	do	George Ormiston, Raglan, Ontario	66 00	
4	do	William Wilson, Ash Grove, Halton	68 00	
5	do	James Wright, Guelph, Wellington	60 00	
6	do	John Hadden, Moontown, Lambton	31 00	
7	do	W. C. Smith, New Hamburg, Waterloo	81 00	
9	Ram Lamb	J. C. Snell, Edmonton, Peel	25 00	
10	do	W. G. Hill, Rockwood, Wellington	18 00	
11	do	J. Devitt, Floradale, Waterloo	25 00	
12	do	W. R. Elliott, Glenallan, Wellington	27 00	
13	do	B. Williamson, Glammis, Bruce	27 00	
14	do	A. Fyfe, Guelph, Wellington	21 00	
15	do	W. G. Hill, Rockwood, Wellington	20 00	
16	do	George Rudd, Guelph, Wellington	38 00	
17	do	J. C. Snell, Edmonton, Peel	49 00	
18	do	W. G. Hill, Rockwood, Wellington	17 00	
19	do	W. Rodden, Plantagenet, Prescott	25 00	
20	Pair Aged Ewes	H. Arkell, Arkell, Wellington	30 00	
21	do	H. Arkell, Arkell, Wellington	40 00	
22	do	H. Arkell, Arkell, Wellington	38 00	
23	do	W. Quennell, Newbridge, Huron	32 00	
24	do	Robert Martin, Lucknow, Bruce	26 00	
25	Pair Ewe Lambs	H. Sorby, Guelph, Wellington	48 00	
26	do	H. Sorby, Guelph, Wellington	38 00	
27	do	H. Sorby, Guelph, Wellington	70 00	
28	do	R. Campbell, New Hamburg, Waterloo	26 00	
29	do	H. Sorby, Guelph, Wellington	32 00	
30	do	H. Sorby, Guelph, Wellington	30 00	
31	do	J. C. Snell, Edmonton, Peel	26 00	
				1,112 00
		Carried forward		1,682 00

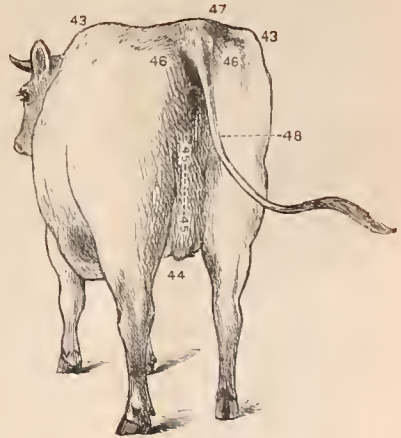
the

Spine.
Flank.
Plates.
Rumps.
Hips.
Thighs.
Hocks.
Hind Leg
Brisket.
Bosom.

A MODEL STEER, WITH PARTS NAMED (as taught at the Ontario Experimental Farm).







1. Mouth.
2. Nostrils.
3. Lips.
4. Muzzle.
5. Face
6. Eyes
7. Cheeks
8. Jaws.
9. Forehead.
10. Poll.
11. Horns
12. Ears.
13. Neck.
14. Throat
15. Dewlap.
16. Shoulders.
17. Shoulder Point.
18. Shoulder Vein.
19. Elbows.
20. Arm.
21. Knees.
22. Shanks.
23. Hoofs
24. Crops
25. Fore Flank.
26. Fore Ribs
27. Mid Ribs.
28. Hinder Ribs.
29. Barrel.
30. Belly.
31. Spine.
32. Flank
33. Plates
34. Rumps.
35. Hips
36. Thighs.
37. Hocks.
38. Hind Leg.
39. Brisket.
40. Bosom.
41. Chest.
42. Loin.
43. Hooks.
44. Purse.
45. Twist.
46. Pin Bones.
47. Tail Head
48. Tail

2.—Public Sale of Surplus Live Stock, 10th September, 1880.—*Continued.*

Lot.	CLASS.	PURCHASER.	Amount.	Total.
			$ c.	$ c.
	Leicesters.			
		Brought forward		1,682 00
32	Shearling Ram	W. J. Ross, Smith's Falls, Lanark	41 00	
33	do	W. R. Motherwell, Perth, Lanark	40 00	
35	do	Edward Gaunt, St. Helen's, Huron	52 00	
36	do	H. Hammond, Cainsville, Brant	48 00	
37	Ram Lamb	J. R. Bullock, Hopetown, Lanark	23 00	
38	do	H. Glakebrook, Simcoe, Norfolk	47 00	
39	do	W. J. Ross, Smith's Falls, Lanark	18 00	
40	do	J. Cuppage, Orillia, Simcoe	21 00	
41	Pair Aged Ewes	James Scott, Glenmorris, Waterloo	28 00	
42	do	J. R. Bullock, Hopetown, Lanark	20 00	
43	do	Robert Martin, Lucknow, Bruce	16 00	
44	Pair Ewe Lambs	H. Glazebrook, Simcoe, Norfolk	14 00	
45	do	W. R. Motherwell, Perth, Lanark	66 00	
46	do	H. Glazebrook, Simcoe, Norfolk	42 00	
47	do	H. Glazebrook, Simcoe, Norfolk	50 00	
				526 00
	South Downs.			
48	Two Shear Ram	M. A. Dawes, St. Aure de Bellevue, Que.	27 00	
49	Shearling Ram	George Hood, Guelph, Wellington	53 00	
50	Ram Lamb	H. Sorby, Guelph, Wellington	26 00	
51	do	Thomas Whale, Goldstone, Wellington	11 00	
52	do	Robert Marsh, Richmond Hill, York	24 30	
53	do	George Hood, Guelph, Wellington	30 00	
54	do	George Bush, Jordan, Lincoln	24 00	
55	do	Richard Martin, Verdun, Bruce	31 00	
56	do	John Jackson, Abingdon, Monckton	28 00	
57	Pair Ewe Lambs	H. Sorby, Guelph, Wellington	50 00	
58	do	H. Glazebrook, Simcoe, Norfolk	70 00	
59	Pair Aged Ewes	W. R. Motherwell, Perth, Lanark	42 00	
				406 00
	Oxford Downs.			
60	Ram Lamb	Benjamin Story, Picton, Prince Edward	41 00	
61	do	George Hood, Guelph, Wellington	31 00	
				72 00
	PIGS.			
	Berkshires.			
1	Boar	C. V. F. Bliss, Ottawa, Carleton	25 00	
2	do	F. X. Kieffer, Formosa, Bruce	26 00	
3	do	J. S. Smith, Maple Lodge, Middlesex	16 00	
4	do	J. R. Bullock, Hopetown, Lanark	15 00	
5	do	A. Denman, Canonbrook, Huron	11 00	
6	do	William Mathews, Guelph, Wellington	21 00	
7	do	William Mills, Wingham, Huron	9 00	
8	do	D. Brand, Forest, Lambton	15 00	
9	do	Robert McKim, Parker, Wellington	21 00	
11	Sow	Alexander McDonald, Brooksdale, Oxford	18 00	
12	do	W. R. Motherwell, Perth, Lanark	16 00	
13	do	William Spark, Petherton, Wellington	17 00	
14	do	C. Darby, Gourock, Wellington	7 00	
15	do	A. Darling, Mildmay, Bruce	7 00	
16	do	James Douglas, Galt, Waterloo	10 00	
17	do	J. A. R. Anderson, Clifford, Wellington	7 00	
18	do	George Green, Brooksdale, Oxford	11 00	
19	do	A. Nicol, Guelph, Wellington	9 00	
20	do	D. Gerrand, Guelph, Wellington	7 00	
22	do	Robert McKim, Parker, Wellington	8 00	
23	do	Charles Youngs, Brooksdale, Oxford	10 00	
				286 00
		Carried forward		2,972 00

PUBLIC SALE OF SURPLUS LIVE STOCK, 10TH SEPTEMBER, 1880.—*Continued.*

LOT.	CLASS.	PURCHASER.	AMOUNT.	TOTAL.
	S. Windsor.		$ c.	$ c.
		Brought forward		2,972 00
24	Boar	William Aitchison, Elora, Wellington	15 00	
25	do	Joseph Zeben, Baden, Waterloo	8 00	
26	do	Thomas Dunbar, Marden, Wellington	4 00	
27	do	Benjamin Story, Bloomfield, P. E. County	8 00	
28	do	W. H. Mathews, Guelph, Wellington	13 00	
29	Sow	M. P. Doyle, Guelph, Wellington	5 00	
30	Boar	Benjamin Story, Picton, Prince Edward	6 00	
				59 00
	DOGS.			
	Scotch Collies.			
1	Dog	P. J. Woods, Guelph, Wellington	12 00	
2	do	Thomas Crawforth, Brampton, Peel	11 00	
3	do	W. McAllister, Rockwood, Manitoba	12 00	
4	do	Thomas Crawforth, Brampton, Peel	13 00	
5	do	W. McAllister, Rockwood, Manitoba	18 00	
6	do	H. Glazebrook, Simcoe, Norfolk	11 00	
7	do	C. V. F. Bliss, Ottawa, Carleton	10 00	
8	Bitch	James Anderson, Guelph, Wellington	8 00	
				95 00
	WHEAT.			
	47 Lots—188 Bushels, at $1.15	per Bushel		216 20
		Gross Total		$3,342 20

2.—COMMENTS AND AVERAGE PRICES REALIZED.

Much comment on this sale is unnecessary by me. It is sixty per cent. over my valuation to you in August last, and fifty per cent over all previous sales. The reasons are not difficult to find in a wider and keener demand to meet the changing conditions of more flesh and less flour production for the foreign market, the reliability of the stock, and the unrestricted character of the sale. It is a very encouraging fact for the Government that not one animal went over our borders this year. The one point insisted upon by our farmers now is, that the breeding must be kept up by new importations. Following find average price realized for each class of animals.

		EACH.
Shorthorn calves	3	$76
Aberdeen polled calves	2	68
Ayrshire calves	3	69
Cotswold, shearling rams	7	58
" ram lambs	11	27
" aged ewes	10	17
" ewe lambs	14	18
Leicester shearling rams	4	45
" ram lambs	4	27
" aged ewes	6	11
" ewe lambs	8	22
Southdown, two-shear ram	1	27
" one "	1	53
" ram lambs	7	27
" ewe lambs	4	30
" aged ewes	2	21

		EACH.
Oxford Down, two ram lambs	2	$36
Berkshire Boars	9	18
" Sows	12	11
Suffolk Windsor Boars	6	9
" Sow	1	5
Scotch Collie Dogs	8	12

4.—Public Patronage to our various Rams.

From 20th October to 18th November, we have been honoured with the following patronage to our different rams, being three times more than any previous season.

Cotswold	63 ewes.
Leicester	59 "
Oxford Down	58 "
South Down	26 "
Shropshire Down	18 "
Merino	3 "
	227

The Cotswolds are in view for the American market; the Leicesters partly for that market, our own, and in preparation for exhibitions; the Oxford Down cross has been induced by the very satisfactory results of our own experiments in that line during the last three years; the South Downs also in view of the right kind of wool for our own manufacturers, and mutton for England; the Shropshire Down is as yet purely experimental for similar purposes with the Oxford and South Down; and the Merino is but a faint recognition of grand wool and a questionable mutton maker.

We are not prepared to keep up this increasing demand for such service unless by new importations, and more of them. The Government has to say if they are willing to help in the improvement of the grade sheep of the Province, as this is not a local demand, many of the sheep having come more than one hundred miles.

5.—Increase to Live Stock.

From 31st October, 1879, to 1st November, 1880, we have, by our own breeding, received the following thoroughbreds.

Cattle.

9th Nov., 1879.—Lady Campbell, Shorthorn, out of Ury 11th, by Duke of Bedford (36,466).

14th Feb., 1880.—Beauty of Wellington, Ayrshire, out of Beauty of Drumlanrig, by Sir Walter.

16th April, " —Heather Belle 2nd, Hereford, out of Heather Belle, by Duke of Connaught ( ).

26th April, " —Flora of Waterloo, Ayrshire, out of Flora 3rd of Drumlanrig, by Sir Walter.

22nd May, " —Sir Walter 2nd, Ayrshire, out of Juno 2nd of Drumlanrig, by Sir Walter.

5th June, " —Duke of Bedford 2nd, Shorthorn, out of Louan of Brant 5th, by Duke of Bedford (36,466).

15th July, " —Lady Bedford, Shorthorn, out of Lady Elizabeth, by Duke of Bedford (36,466).

23rd July, " —Earl of Fife, Aberdeen Poll, out of Lochiel Lass 4th (1864), by Gladiolus (1161).

19th Oct., " — ——————— Shorthorn, out of Cambridge 10th, by Duke of Bedford (36,466).

Sheep.

Cotswolds—	Ram lambs	20	from 38 ewes.
	Ewe "	31	
Leicesters—	Ram "	8	" 17 "
	Ewe "	18	
Southdowns—	Ram "	14	" 17 "
	Ewe "	12	
Oxford Downs—	Ram "	5	" 4 "
	Ewe "	4	

Swine.

Berkshire—	Boars	11	from 4 sows.
	Sows	13	
Suffolk Windsor—	Boars	6	" 2 "
	Sows	2	

We have, therefore, in the case of sheep, the very large average of $1\frac{1}{3}$ lamb from every Cotswold ewe; $1\frac{1}{2}$ each from Leicester and Southdowns, and no less than $2\frac{1}{4}$ lambs from each Oxford Down ewe.

Mr. George Hood, of Guelph, was again at the great American fat stock competition at Chicago, where he took three sweepstakes, six firsts, and two second prizes, with sheep, many of which were bred and fed at the Ontario Experimental Farm.

By invitation of the Toronto Industrial Exhibition Association, and of the Agricultural and Arts Association of Ontario, we sent specimens of all our herds and flocks to their shows this year, at Toronto and Hamilton, respectively. None of the animals had been prepared, by feeding, for such a purpose, and while, therefore, not in what is called show condition to please the few tens, their healthy and vigorous tone was admired by the more reasonable and common sense hundreds. We acknowledge to several wants, both in cattle and sheep, but as regards management, think we hold to the fair medium as regards flesh.

IV.—THE GARDEN.

1.—Vegetables.

The whole produce of this section has been unusually good—things in season and reliable at all times. While we have always had difficulty, we have never failed in bringing cabbage of all sorts to perfection—large, firm, and sound—red especially, seeming to be unusually hardy. Cauliflower were not equal to the cabbage this year; beets and turnips, particularly the former, were good, and carrots gave 800 bushels per acre. Onions were more than good—being also large, prolific, sound, and not rough. Our celery was the admiration of hundreds—we never had it so long, delicate, solid, and sappy. Potatoes were but fair in quality, somewhat on the small side, though plentiful. The most of other kitchen garden crops were represented—even to a regular and bouutiful supply of mushrooms. In naming tomatoes, we have to speak of such an unusually large crop that the difficulty was to get people to take them for nothing.

2.—Fruit.

The apple crop was abundant—maybe a little on the small side for size, and decidedly wormy. Grapes, as usual, were a fair crop, and I have pleasure in notifying that our new gardener, Mr. Forsyth, is preparing for next season, an account of the habits, characteristics, and general conduct of some fifteen of the most hardy and reliable sorts in our possession. The culture of this valuable fruit is now one of provincial interest, and anything tending to instruct in its successful spread, cannot fail to be appreciated. Pears are, as yet with us, not plentiful enough to demand much notice; we have, however, a goodly number of young thriving trees. We cannot grow the gooseberries of English fame; mildew, and louse, beat us on all hands despite all appliances, but currants are invariably a fair crop.

3.—Flowers.

The area of these was not so large as usual, because of being confined to their proper domain. Terrace potted geraniums, as well as those in beds, gave a regular succession of plentiful blossom from June to October. Annuals of all kinds made a fine show. Our English visitors gave praise to our roses—fact enough without comment from us, and thus I leave them.

4.—The Arboretum.

We are now in the satisfactory position of being able to speak of "Our Arboretum." A very good beginning has been made, and it has also been a very successful one as regards a safe summer catch and some growth. The spot selected for this interesting educational display, lies to the north and east of the main approach to the College, being the triangular part of the pleasure grounds between this approach and the public road, extending to about three acres. Here, it is proposed to establish individual specimens of every tree and shrub from any country, that is found to succeed in our climatic conditions. This means time, some money, patience, and a thorough interest on the part of all concerned.

It gives me much pleasure to acknowledge the interest taken in this branch of our rural economy by the Fruit Growers' Association of Ontario, as represented by Messrs. Beadle, Saunders, Arnold, Dempsey, Beall, and Leslie.

It will be enough, meantime, to place on record the names of those trees and shrubs planted here. All have been properly labelled at considerable expense. Those marked * are in the arboretum.

List of Ornamental Trees.

*Acer Dasycarpum laciniatum, or Cut-leaved Maple.
Acer Pseudo Platanus, or European Sycamore.
Acer Saccharinum, or Sugar Maple.
Acer Rubrum, or Scarlet Maple.
*Acer Platanoides, or Norway Maple.
*Æsculus Hippocastanum, or Horse Chestnut.
*Alnus Glutinosa, or European Alder.
Alnus Glutinosa Laciniata, or Cut-leaved Alder.

*Betula Alba, or White Birch.
*Betula Pendula Laciniata, or Cut-leaved Weeping Birch.
*Betula Lenta, or Sweet Birch.

Cerasus Pumila Pendula, or Dwarf Weeping Cherry.
*Cleditschia Triacauthos, or Three-thorned Honey Locust.

Enonymus Europius, or European Spindle Tree.

Fraxinus Americana, or White Ash.
Fraxinus Nigra, or Black Ash.
Fagus Sylvatica, or Common Beech.
Fagus Purpurea, or Purple-leaved Beech.

*Gymnocladus Canadensis, or Kentucky Coffee Tree.

*Juglans Nigra, or Black Walnut.
*Juglans Cenerea, or Butternut.
Juglans Regia, or European Walnut.

*Koelreuteria Paniculata, or Panicled Koelreuteria.

*Liriodendron Tulipifera, or Tulip Tree.

*Magnolia Acuminata, or Cucumber Tree.

Nyssa Villosa, or Sour Gourd.

*Pyrus Aucuparia, or European Mountain Ash.
Pyrus Aucuparia Americana, or American Mountain Ash.

*Salisburia Adiantifolia, or Maiden's Hair Tree.
*Salix Caprea Pendula, or Kilmarnock Weeping Willow.

*Tilia Europea, or European Lime Tree.
Tilia Americana, or American Basswood.
Taxodium Destichum, or Deciduous Cypress.

Viburnum Lantiana, or Wayfaring Tree.

List of Evergreen Trees and Shrubs.

*Abies Excelsa, or Norway Spruce.
*Pica Balsamea, or Balsam Spruce.
*Abies Nigra, or Black Spruce.
*Abies Alba, or White Spruce.
*Abies Canadensis, or Hemlock Spruce.

Pinus Sylvestris, or Scotch Pine.
*Pinus Austriaca, or Austrian Pine.
*Pinus Pumilio, or Dwarf Mountain Ash.
*Taxus Canadensis, or Canadian Yew.

*Retinispora Plumeosa, or Plum-like Retinispora.
*Retinispora Pisifera, or Pea-fruited Retinispora.
Retinispora Squanosa.

Thuja Occidentalis, or American Arborvitæ.
*Thuja Siberica, or Siberian Arborvitæ.
*Bioata Orientalis, or Chinese Arborvitæ.
*Thuja Orientalis, or Rollissin's Arborvitæ.
*Thuja, or Parson's Dwarf Arborvitæ.
Thuja, or Booth's Arborvitæ.

Spirea Prunifolia, or Plum-leaved Spirea.
*Spirea Opulifolia, or Golden-leaved Spirea.
Spirea Ulmifolia, or Elm-leaved Spirea.
Spirea Sorbifolia, or Service Spirea.
Spirea Chamaedrifolia, or Germander Spirea.
Spirea Billiardii, or Billiard's Spirea.
Spirea Callosa, or Large-flowered Spirea.
Spirea Fortunii, or Fortune's Spirea.
Spirea Ruvesii, or Lance-leaved Spirea.
*Spirea Thunbergii, or Thunberg's Spirea.
*Spirea Semperflorens?
Symphoria Glomerata, or Indian Currant.
Symphoria Racemosa, or Snowberry.

Rosa Canina, or Dog Rose.
Rosa Micrantha, or Sweet Briar.

Viburnum Opulus, or Guelder Rose.

*Weigelia Rosea, or Rose-coloured Weigelia.
*Weigelia Varigata, or Variegated Weigelia.
*Weigelia Arborea.
Weigelia Van Hontii.
*Weigelia Hortensis.

List of Deciduous Flowering Shrubs.

*Amygdalis Nana Flore-pleno, or Dwarf Double-flowering Almond.
*Amygdalis Nana Flore-pleno, Pink and White Varieties.

Berberis Vulgaris, or Common Barberry.
Berberis Purpurea, or Purple-leaved Barberry.

Cornus Florida, or Large-flowered Dogwood.
Cornus Sanguinea, or Red-wooded Dogwood.
Corylus Americana, or American Hazelnut.
Cydonia Japonica, or Japan Quince.

Deutzia Scabra, or Rough Deutzia.
Deutzia Cunata Flore-pleno, or Double-flowering Deutzia.
Deutzia Gracilis, or Slender Deutzia.

Lonicera Tartarica, or Tartarian Honeysuckle.

Ligustrum Vulgare, or Common Privot.

Maclura Aurantiaca, or Osage Orange.

*Prunus Triloba, or Double-flowering Plum.
*Philadelphus Grandiflorus, or Large-flowering Mock-Orange.
Philadelphus Coronarius, or Garland Mock-Orange.
*Philadelphus Nevalis, or Mock-Orange.
*Philadelphus Zeyheri, or Mock-Orange.

Rhus Cotinus, or Venetian Sumach.
Ribes Arnum, or Yellow-flowering Currant.
Robinia Hispida, or Rose Acacia.

Syringa Vulgaris, or Common Lilac.
Syringa Persica, or Persian Lilac.
Syringa Josikæa, or Deep-flowered Lilac.

5.—The New Orchard.

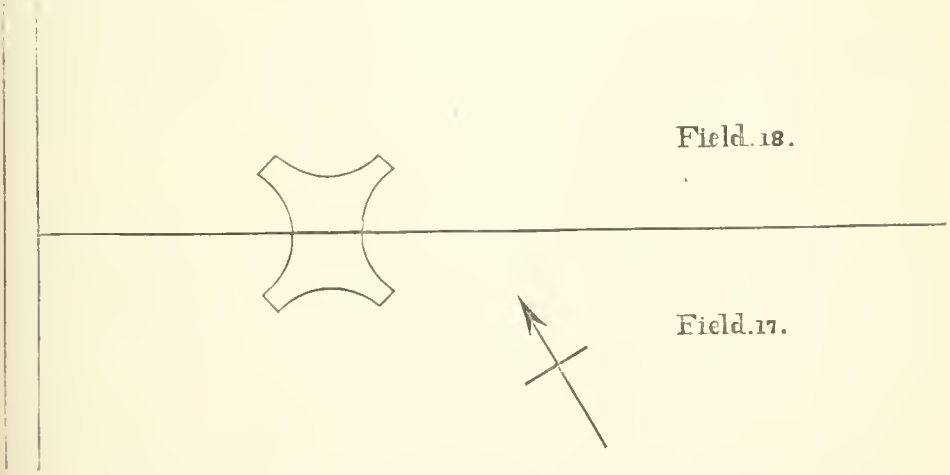
I had your instructions to give the Committee of the Fruit Growers' Association of Ontario such part of one of our fields as would be suitable, by general convenience, aspect, and soil, for the purpose of experimenting with, and establishing, those varieties of apples, pears, and plums found suitable under the circumstances. The idea is to show to the country as a whole, and to the students of this institution, what can be accomplished on

high lying and exposed situations in the growth of such fruit: anybody can do a great deal when all nature is propitious, but to attain success under difficulties means many good lessons, and such lessons as always lead to much greater success in more favoured districts than ours. The ground chosen is part of Field 10, adjoining the cheese factory and south barns—holding a north-eastern as well as a southerly aspect, with a light clay loam, gravelly loam, and a deeper and somewhat heavier clay loam, on parts. It will be the duty of the Committee to report to you in regard to kinds already planted and the success thereof,—it is simply mine to make this acknowledgment, and the assurance that the subject is in safe hands,—Messrs. Beadle, Saunders, Arnold, Dempsey, Beall, and Leslie, already command the confidence of the Province, and what they do shall be unspeculative, practical, scientific, thorough, and reliable.

6.—Tree Clumps and Shade Trees.

It is some comfort to be able to tell of increased respect, on the part of our farmers, for what was once one of their hindrances to field culture. That a tree is not now altogether a mass of so much rubbish, even in the more uncleared districts, is due to *felt* wants and persistant teaching. I cannot overstate, and I think you will testify I do so from no servile motives, how much the Government, and especially yourself, are desirous of fostering the knowledge and practice of tree culture with a view to immediate shelter, climatic influences, and ornament. The subject is simply immeasurable in its effects, and even now absolutely one of dollars and cents. In our recent evidence before the Agricultural Commission, you will remember that even the plain matter-of-fact farmers, when pushed to the point of saying what difference they would make in the choice of two farms, alike in every respect, except tree shelter, and how much they would give for the one over the other, agreed that such shelter was not limited by at least one-third; which simply means that a $10,000 farm with sufficient tree shelter is reduced to $6,700 without it.

Working up to this, we are not only experimenting, as explained in another chapter, but under the direction of the Fruit Growers' Association of Ontario, we have this year begun the planting of tree clumps and shade trees throughout the farm, with a variety of kinds according to soil and situation. A leading idea in such work is immediate shelter and shade for live stock in the cultivated fields, and as the line between Fields 17 and 18 is high lying and exposed to the north and west, we have laid off a one-acre Black Walnut clump in the following form and position:



By this arrangement it will be observed that from *whatever direction* shelter is required in *either of the fields*, the animals can obtain it. We are mulching and cultivating

around the plants, and, to date, most of them have done well. Plants, six feet apart all over. A few Austrian pine occupy the north-west boundary.

With the view to screen an old gravel pit in Field 2, as well as to secure a shelter clump, we planted European larch around and in this gravel pit similarly to the above—result, almost an entire failure by reason of three things: (1) heated plants on a long journey from the States; (2) a summer of much drought; and (3) want of sufficient soil among the gravel and stones. Austrian Pine were also placed here as a wind break upon the north-west; some of them have struggled through the severe weather and poor conditions.

As a variety to our road-side and field-fence-side shade trees, we planted this year several hundreds of horse chestnut and European linden, alternating with each other and with our own maple, at thirty feet apart. They are all doing well, though we expect some deaths next year.

V.—THE MECHANICAL.

In the application of improved appliances to farm operations, we have made considerable progress during the past year. While it is our duty to teach and show the management of horse power in all its details, it is also ours to be up to the times, when what is otherwise available has been thoroughly tested either by ourselves or others. In this respect I have to acknowledge the introduction of steam power on our farm in the form of Waterous' (of Brantford) well-known Champion engine, twelve-horse power, vertical boiler, and spark proof furnace. Two horses can haul it to any position. It is easily understood, simple in construction, easily managed, requires small amount of fuel, and can be applied to any sort of work; this winter we have already had it in a field threshing a stack of peas, in the bush cutting cordwood, and, thrice a week, driving the straw-cutter, root-pulper and grain-crusher in the barn. The separator in connection with this engine is that of Sawyer, of Hamilton, and so far as experienced it has given much satisfaction. In all the alterations and improvements consequent on this change of motive power, our Mechanical Foreman, Mr. McIntosh, has been thoroughly at home, and many valuable lessons have been thus afforded the students.

We have also had great pleasure in working the mower of the Toronto Reaper and Mower Co. We have as yet had nothing equal to it in simplicity, easy motion, small tear and wear, light draught, facility of management under all circumstances and good work.

The strongest and at the same time one of the most efficient reapers in our experience is that of the "Champion." It is the only one that will go through a thick, strong crop of corn fodder safely.

We have had long experience of the Royce (now the Lion) reaper, of Mr. Watson, of Ayr, and can testify to its easy management, simplicity of construction, light draught and good working powers.

VI.—FARM INSTRUCTION.

We are doing our best to make this an efficient department, experiencing no difficulty and finding no wants except the one great one—want of another team of horses to give more opportunities at ploughing and other field operations. With the doubling of our students, this want has been multiplied, of course; and accordingly I must impress upon the Government the absolute necessity of keeping up to the demand upon this field instruction. This can be done with much advantage to the whole farm, in this way:—You are aware that we have been striving to get rid of the very large legacy of thistles, by thorough cultivation on our root divisions, and two or three annual cuttings of them on other divisions. We are progressing, but progressing slowly, and so in order to secure an earlier cleanness all over, I beg to propose that you allow me an extra team of horses for continuous *summer fallowing*, during two or three years, which team should be in the hands of the Instruction Department for practice in ploughing. With this and the present

instruction team we should be in a position to offer every student considerable practice in most farm operations.

I have much pleasure in reporting a winter instruction arrangement, upon an extended scale, to meet increasing wants and progress, as laid down in the following card, which is given to every student.

WINTER 1880-81.

Duties of Students in certain Departments, and upon which they will be examined at Easter, or in June.

I.—FARM CLERK.

1. He shall have charge of the Tool House, and remain in the same during hours of work, unless relieved by the Farm Superintendent, or Farm Foreman, or when otherwise employed.

2. He shall state in the Tool Record Book, the removal or return of any article, noting by whom removed or returned, with its number, name and condition.

3. He shall keep the house in good order, leaving everything in its proper place, receive no article in a dirty condition, and shall daily take to the Carpenter Shop any article requiring repairs, recording the same, and also when returned.

II.—CATTLE GROOMS.

1. To curry and brush all tied up cattle, under the directions of the Head Cattleman.
2. To make themselves acquainted with the different breeds of cattle.
3. To assist the Cattleman at extra work, as may be approved by the Farm Foreman.

III.—FARM ENGINEERS.

1. To assist Head Engineer in placing, levelling, and working the steam engine in all positions for all kinds of work.
2. Preparing fuel and water for engine.
3. Making a thorough acquaintance with the names and duties of every part of the engine.
4. Noting the quantity, value, and effect of certain kinds of fuel, water and steam.
5. To fire, clean, oil, and regulate the steam engine.

IV.—YARD-MEN.

1. To level and mix the manure in cattle court from all the stables daily,—that from Nos. 1 and 2 stables to be removed every Wednesday and Saturday by cart or waggon.
2. To scatter two pail-fulls of gypsum over the cattle court manure heap every Wednesday and Saturday.
3. To pump the liquid manure over the cattle court every Monday and Thursday afternoon.
4. To clean the barn court and road round buildings as may be required.

V.—CATTLEMEN. To be under the Head Cattleman in—

1. Feeding, watering, and bedding cattle, and seeing to their general care.
2. Cleaning cattle stables, and disinfecting same.
3. Seeing to the special care of breeding and milch cows.
4. The handling and management of bulls.
5. The special treatment of calves and young cattle.
6. Feeding, in amount, kind, form, manner, and times, to be studied.
7. The preparation of straw, hay, corn fodder, turnips, mangolds, carrots, peas, barley and corn meal, oilcake, and the use of condiments for food.
8. The kinds and modes of administering medicine.
9. The management of swine in all respects.

10. Making acquaintance with different breeds of cattle and swine.
11. Assisting in, observing progress, and studying, cattle feeding experiments.

VI.—Shepherds. To be under the instructions of the Head Shepherd, in—

1. Feeding and general care of all the sheep.
2. Attention to ailments and diseases.
3. Making acquaintance with the different breeds.
4. Assisting at lambing time, as may be arranged by Farm Superintendent.
5. Noting the kind, quantities and form of food given, and the manner and times of feeding.
6. Observing the kind and progress of experimental sheep feeding.
7. Handling and judging different kinds of wool.
8. Assisting in the feeding of farm horses.

VII.—Experimental Field Plots. To be under the Assistant Superintendent, in—

1. All kinds of work connected with the department.
2. Making an intimate acquaintance with the various kinds of farm seeds and plants.
3. Examining and judging various fertilizing manures.
4. Cleaning and preparing seeds and plants.
5. Observing the time, manner, quantity, form, effects, progress and results of various manures and crops, on certain soils, under conditions of weather, (*summer* principally).
6. Making acquaintance with the diseases of plants.

VIII.—Instruction Department. Students will be under the Instructor, in—

1. Grooming, harnessing and driving horses.
2. Management of working oxen.
3. Use of the axe.
4. Sowing by hand.
5. Management of wood-sawing powers.
6. Grinding tools.
7. Examination of farm implements and machinery.
8. Cleaning grain.
9. Crushing grain.
10. Cutting and pulping food for cattle and horses.
11. Making bands and tying sheaves.

VII.—THE EXPERIMENTAL.

A.—The Animal.

1.—Fattening of Young Cattle.

Few things puzzle the best of us so much as how to ascertain the actual cost of anything produced from the growth of the soil. It is not only very difficult to do, but when done, few believe it. The purchase and formation of a piece of iron into a plough, can be clearly shown in all its details; its beginning, progress and ending, form one straight and double line of debit and credit, without leaving any doubtful issue, or unrealized connection. It is otherwise, for example, with corn and beef,—the result on the one hand of the purchase of land, its taxes, tillage, manuring, and harvesting, and of the breeding, feeding and general management of a cattle beast, on the other hand. The actual estimate of these in their several relations has often been attempted, but never clearly defined; and probably never will be. But, such difficulties should not debar the search for more facts; as the chemist is not yet able to tell us what climate, soils, manures and plants do,

and what certain animal-life does under all conditions, we have the honour of becoming known in some such fashion as this, so that, where we stumble and doubt in our practical awkwardness he may follow to help and make more clear. Take then, at present, the interesting and popular question, for the farmer, of how best to make profit in the production of beef. The commercial standing of a fattened cattle beast consists of three things, of almost equal value; first, that period from birth up to stall feeding; second, the six or seven months of stall feeding; and third, the value of the manure made. Taking a well-to-do animal, well done to all along, and the actual cost and value of everything, including (1) bull service, (2) value of the milk and extra food for twenty-four months, and (3) ordinary feeding, with meal added up to the time when 23 months old, and, on an average, we have expended $40; then the last seven months, while in stall specially arranged for the highest results, will cost $45—together $85—for, say, 1,500 lbs. live weight, or just the market value of the fattened animal in these times. The third thing is the accumulated quantity and value of manure made during these 2½ years, and by all fair figures in our advanced agriculture it cannot be put at less that $40. Practically then, to the farmer, the animal destined for the shambles is a manure making machine, in which relation it produces one-half of the value of itself, and this value represents the only reliable source of profit to him under the better condition of husbandry.

But there are other bearings to this question. As a manure producer, the fattening animal is maturing itself for direct human food, and by all the sound laws of investment and return in risky goods, the sooner it is crowned and disposed of the better for profits. So then the farmer should breed well, feed well, mature early, and sell immediately. This not being believed by everyone, we undertook the following experiment during winter 1879-80:

On 1st October, four steers and one heifer of our own breeding, were selected and tied up in the usual manner with sliding chain. No. 1 was a pure bred Shorthorn steer, 29 months old; No. 2 a pure bred Galloway steer, 25 months old; Nos. 3 and 4 Shorthorn grade steers, 18 months each; and No. 5 a well bred, white grade heifer, 20 months old, at that date. The stamp of No. 1 was somewhat heavy boned and light in the crops, though otherwise good; the Galloway was very fair of his kind, but wanting depth and width in the hind quarters; the two Durham grades were not up in point of merit for fattening—wanting especially in depth and width behind; the heifer was particularly even, being chunky, with fine bone, clean head, and neat all over. As a matter of interest, and one also of education, the second year students judged these animals on entry, using a standard of 1,000 marks throughout some thirty detailed points. The mean of their work stood thus:

No. 1	765
No. 2	697
No. 3	713
No. 4	747
No. 5	696

The object of the experiment was to ascertain how much could be added to the weight of these comparatively young cattle, with certain foods and the cost thereof by high feeding so as to mature, or pre-mature, within eight months.

Bill of Fare per head per day.

From 1st October to 1st March, 12 lbs. pea meal.

From 1st March to 12th April, 12 lbs. corn meal.

From 12th April to 10th May, 12 lbs. pea meal and 2 lbs. oil cake.

From 19th January to 10th May, 2 lbs. extra of pea meal, and 3 lbs. of extra fodder (hay).

During whole course: 12 lbs cut fodder (consisting of 6 parts oat and wheat straw 4 parts cut corn fodder, and 2 parts cut hay), with 2 lbs. bran; 75 lbs. turnips and mangolds pulped, and 2 oz salt, with the offer of water once daily.

Quantity and Cost of Food per head for whole period of 222 days.

Pea meal	2,330 lbs. at	1 cent per lb.	$23 30
Corn meal	504 "	1 " "	5 04
Oil cake	56 "	$33 per ton	0 92
Hay	333 "	$8 per ton	1 66
Bran	444 "	$11 per ton	2 44
Mixed fodder	2,664 "	$4.75 per ton	6 20
Roots	16,650 "	9 cents per bushel of 60 lbs.	24 97
			$64 53

There are three ways of presenting this account: (1) The Farmer's, (2) The Commercial, and (3) The Scientific.

1.—The Farmer's,

who says, "my straw, bran and roots have cost me no actual cash; they have come as part and parcel of the material that I do not usually put to market, like my grain, and therefore in feeding them to my animals I do so simply to feed and make manure; I cannot see the sense of charging those against my fattening stock any more than to the horses, milk cows and calves." So, then, the farmer's reckoning takes the following shape:

"1100 lbs. at 4c., when bought, or entered for feeding	$44 00
Meal, cake and hay	30 92
	$74 92
Sold 1477 lbs. live weight at 6c.	88 62
Giving a cash profit of	$13 70

And I have all the manure into the bargain."

2.—The Commercial,

who argues that we must debit and credit everything as any merchant does, whether the farmer is in the habit of selling them or no. Their growth must have cost something, and whatever they would fetch in the market should be debited to the consumer; so, then:

1100 lbs. at 4c.		$44 00
Meal, cake and hay		30 92
Fodder and roots		33 61
		$108 53
Credit 1477 lbs. at 6c	$88 62	
" 7 loads manure	7 00	
		95 62
Showing an apparent loss of		$12 91

3.—The Scientfic.

But a wider view of this question is taken by him who checks his practice by scientific chemical help, who is dissatisfied not only with the farmer's unregistered method of manure making, but cannot even recognize the more careful business man who estimates the value of farm-yard manure by the load, and at a price that is solely regulated by the

farmers themselves. This third party shows that with the facts of soil foods, and that plants require so much of them to produce certain results under certain conditions, we must respond to their teachings and allow value accordingly for any form of materials which are known to possess so much of the properties that go to sustain soils and build up crops, also of known values. Thus we now submit the advanced or modern form of the subject:

Value of animal bought in or home bred			$44 00
Value of materials consumed			64 53
			$108 53
Fattened animal realized		$88 62	
Chemical value of manure, from			
1⅙ ton pea meal at $15.50	$18 08		
¼ ton of corn meal at $7.50	1 87		
1/10 ton of oil cake at $22.50	5 65		
1½ ton fodder at $2.50	3 75		
8 tons roots at $1.00	8 00		
⅓ ton bran at $14.50	2 90		
		40 25	
			128 87
Balance, being clear profit			$20 34

The practical feeder will notice what the general reader may overlook, that the *corn* and *pea* meal cost per bushel what is usually understood to be too high to pay for such a purpose. Indeed, this is correct in the view of any of the three valuators named, though it tells particularly hard on the method of the so-called matter-of-fact farmer. Practically, we (Ontario farmers) have been looking at 45 cents per bushel for corn, and 50 cents for pea meal as the safe figures for cattle-feeding. We could get corn about this two years ago, now nothing under one cent per pound. This difference of, say, one-third represents in the production of flesh and manure by the 100,000 fattening cattle from Ontario, the handsome sum of $250,000.

The five cattle thus illustrated went in on the 1st October at an average weight of 1100 lbs. and came out on 10th May at 1477 lbs., having therefore increased 375 lbs. each during 222 days.

The pure-bred Shorthorn increased at the rate of 2·05 lbs. per day, or 23 per cent. upon his original weight.

The pure-bred Galloway increased at the rate of 1·66 lb. per day, or 24 per cent. upon the original weight.

The three Shorthorn grades increased at the rate of 1·74 lb. per day (one as much as 2·12), or 37 per cent. upon their original weight.

It took 17 cents for food to make one pound of flesh (and its associations) in animals that were pressed or pre-matured at 29 months old.

The food and flesh thus handled gave 11 cents value of manure for every pound of flesh added.

The difference between the cost of additional flesh and the value of manure obtained is exactly equal to the price got for the live animal, or 6 cents per lb.

The value of the manure was equal to one-half the value of the finished animal.

Were little or no value placed upon manure, the production of beef, under such circumstances, would lead to serious loss.

But, besides these facts, the food thus used increased the value of the *original* carcass from 4 to 6 cents per lb., making an item of $22 per head.

Thus one pound of new flesh improved every three pounds of the old, and added one-fourth to the whole carcase value.

2.—Fattening of Young Sheep.

One of the important questions of these times with us is, how best to produce the earliest, cheapest, and most choice, mutton for the British market? As an experimental station, we have had considerable experience in testing the various breeds and crosses, with different kinds of food, in view to this end, for the use of the Province, and now feel some confidence in submitting the conclusions that have taken solid shape here of late.

Let us preface by saying that most things to attain the greatest success should be made a specialty of—one thing engaging the whole individual attention. This is the case in sheep-farming, and particularly so in the growth of wool and mutton, for good wool and good mutton are one thing in the same animal, in Canadian economy. We shall, therefore, speak of the fattening of sheep as a particular branch of farming. We know our markets: England will take our mutton, if we offer it at moderate weight, and well mixed, and our own manufacturers will take our wool, if of good quality and medium length. What shall we do to supply these?

It is not the irregular and patchy plan of the feeding of sheep of any sort, in connection with our mixed farming, that will be able to meet the demand or compete with other countries; the work must be brought to a special business on a larger scale, and with the stamp of animal found to produce the two wants named. Of course everybody is not expected to jump into this new line, but I affirm, that unless it is systematized by a considerable proportion of our farmers who have *conditions favourable to its best success*, Ontario need not hope to face the world as she is now doing with her cattle. The regular breeder of pure blood will always take the lead as a breeder, and he must keep what is most in demand, either for ourselves or for the United States. Because the heavy long wools are not so much looked to for the fine mutton and kind of fleece desirable for the subject under treatment, it does not follow that their importance is on the wane. Over the reach of this continent, with its immense variety of physical conditions, the old openings and many new ones will always exist for the Leicester, Lincoln, and Cotswold, whatever comes across the field of other special mutton and wool for particular purposes.

The fact of Europe being mapped out, very clearly, in altitudes and geological areas by thyse breeds of sheep that have, as it were, of themselves made the survey for their own special wants, should be lessons to us in choosing locality for Leicester, Lincoln, Cotswold, or Downs. There is no mistaking the actual value of this point, and it is one with which too few of our leading farmers are conversant. If a farm consists of somewhat heavy soil from alluvial deposit upon the flats of our Province, and is situated at less than 200 feet above sea or lake level, it would be at least unnatural to expect the best results from the introduction of the Southdowns; but, on the other hand, where a lighter character of soil prevails, upon any of our limestone formations, at an elevation over seven or eight hundred feet, then the Southdown may be expected to maintain his peculiarities. The very aspect, colour and smell of the soil has to do with animal success.

So then we say to the general Ontario farmer, choose the breed suitable to your farms, and according to the well known physical characteristics of their respective European habitat, the chances being in favour of larger profits.

We have, let us say, on 1st October, a flock of 100 common grade Canadian ewes, roomy, well wooled, healthy, and averaging 3 shear, that cost $7 each; to them we put two pure bred Southdown shearling rams that cost $30 each; they are fed upon pastures alone, the rams getting meal by special arrangement. They are housed for the winter on 15th November, in two large, airy sheds, with open courts, both open at all times, and are fed upon hay, pea-straw, turnips, pea meal and bran, as also mangolds previous to lambing, with plenty of water and salt. Lambing begins on 1st March, in a separate apartment adjoining; and now practical knowledge guides fifty per cent. of the whole undertaking. Some deaths of ewes and lambs will occur, whatever the nature of the management. It is presumed you "know the face" of every ewe, that you are well up in the indication of "time" and lambing, that you have the common sense to let well alone when the ewe is in labour, and yet the skill to know what to do when help is needed. Be regulated by the weather as regards confinement, and by the strength of the lamb and disposition of the mother as regards individual crib confinement for a few days. Continue previous

diets, and add mangolds, with some boiled barley; shorten tails and castrate when about twelve days old. Lambs will soon nibble at clover hay leaves, so that when three weeks old, let them have access to places where they can get their own share of everything; thus the "calf" flesh is never lost whatever the condition of the mother. Give early freedom to open air on fine days, but do not put to grass too early, so that the search for a living runs away with the previous management. *Change*, and *change*, and *change*, when on pasture, remembering that it is variety of grasses we need in Ontario, more than the quantity of one thing. Keep your eye on scours and foot sores, and do not grudge some meal to all lambs. Cull and dispose of some of your wether lambs as the market tempts about 1st May. Clip ewes during second week in May, and wean lambs about 1st July. Dip all lambs in "McDougall," so as to clean skin and wool, remove or prevent vermin, remove or prevent itch and scab, soften wool, keep off rain and cold, increase the natural yoke, and give a healthy tone all over, though fortunately Canada is very ignorant of much of these. Put ewes to poor pasture for a week, and the lambs upon the best clover runs, with a touch of meal as before. Should pastures grow scant, treat to a run in the orchard, or to a cut from any of the green fodders; never stint, never allow to go back. An early fall of snow will do no harm to sheep if "foggage" be good, but it is certain that late housing means twenty per cent. less progress during winter. Feeding during the second winter similar to the first, but in larger quantities proportionate to age, will bring our lambs to be made shearlings in end of April. Of course the most careful must be prepared for deaths at any time, but on an average it may be taken as a safe figure to have brought through 1¼ lamb per ewe.

It will now be interesting to make up our Balance Sheet, adopting the common farmer's method of doing so.

The Farmer's Calculation.

He says he should only charge what it costs him in *cash*, or value for stuff he can easily put into cash, for extra food for each sheep for twelve months, and for each lamb until it becomes a shearling.

In addition to this, they get four lbs. pea straw, eight lbs. of roots, and the summer's pasture each per day.

With so many things to handle, fully half the time of one man is taken up with them, so wages amounting to $100 have to be debited.

Four ewes died, and their loss must be charged, as also the value of 10 shearling ewes retained to make good three deaths, and others that may occur ere next winter.

The ewes will give an average of 6 lbs. and the shearlings 9 lbs. of washed wool.

BALANCE SHEET.

Required for 100 ewes, and 125 lambs:

EWES, 100:	Pea meal, ½ lb. each per day, from 1st Oct. to 1st May. 210 days = 105 lbs × 100	175 bushels.
	Bran, ½ lb. each per day, for same time	5 tons
	Barley, ½ lb. each " " for 40 days ending 1st May	34 bushels.
	Roots, 210 days—8 lbs. each per day	2,800 "
	Hay, 210 " 4 lbs. each, for half time	21 tons
	Pea-straw, 210 days, 4 " " " "	21 "
LAMBS, 125:	Pea-meal, 360 days, ½ lb. from 1st May to 1st May	375 bushels.
	Bran, ½ lb. per day, 360 days	11 tons
	Barley ¼ lb. " 40 days	21 bushels.
	Roots, 210 days, 8 lbs. each	3,500 "
	Hay, 210 " 4 " " for half time	25 tons
	Pea-straw, 210 days, 4 lbs. each, for half time	25 "

Pasture for both	40 acres.		
Green fodders	5 "	to help pastures.	
TOTAL REQUIREMENTS and value thereof:			
Pea-meal	550	bushels,	$ 330
Bran	16	tons,	160
Barley	55	bushels,	33
Roots	6,300	"	
Hay	46	tons,	368
Pea-straw	46	"	
Medicine			10
Dipping			10
Attendance			100
Pasture and green fodders			
			$1,011
Keep of two rams			18
			$1,029
Allowance for deaths			50
			$1,079
Wool	$ 561 00		
Sale of 115 fat shearling wethers and ewes, 180 lbs. at 5c	1,035 00		
Value of 10 shearling ewes kept	80 00		
	$1,676 00		
Balance to credit			597
			$1,676

And the farmer says,—besides this cash balance of $597, I have all the manure left in the yards, as also that upon the pastures, which, if valued similar to what is done in fattening of cattle, is worth, at least another $600.

Well managed pastures will maintain three sheep per acre for the season.

These profits are upon an original invested capital of $760, or, allowing for incidentals, say, $850.

And now, the practical question is, how many cultivated acres does it require to produce enough to maintain this flock? The question is really one of ordinary mixed farming, and not necessarily one of sheep, because we are not to try the making of permanent pasture and purchasing all extra food, but to ascertain what any common farmer may do without any outside help—the cultivation not to overlook the usual wants of the household.

Acreage required in Ontario to produce the necessary food in two seasons:

Peas and pea-straw	20 acres (10 acres of grain too much) but to be exchanged for bran.
Barley	1 acre.
Roots	5 acres.
Hay	20 "
Pasture	40 "
Green fodder	5 "
	91 acres.
Add ⅓	31
	122

It will be observed that besides the maintenance of the lambs during the second winter, the ewes (now again in lamb) have also to be provided for; this means one-third more, so that we get at an area of 122 acres as necessary to do well to 100 ewes and 125 lambs during what is practically two years, though only 18 months as shown in detail. We are therefore driven to make another balance sheet to cover the ewes as they stand at next clipping:

Balance brought down		$ 597 00
Food of ewes during second winter	$296 00	
125 lambs, two months old		350 00
Wool from 100 ewes		140 00
Keep of two rams	18 00	
	$314 00	$1087 00
Balance, being cash credit for two seasons	$773 00	

We have then $386 per annum from an original investment of $800, which certainly is a grand outcome, if true. Its truth may be questioned by the regular accountant, who argues that we must debit everything fed and all labour employed, whether by the hands of the farmer himself, his son, or the hired man. There can be no objection to this, if, on the other hand, the actual present and future value of the manure can be ascertained. I have endeavoured, in the reports of this farm, to show this in regard to cattle, but there is not only the greater difficulty of estimating quantity from sheep, but to allow for the greater proportionate chemical value of their droppings. We are not, now-a-days, to be held to so much per load. He who checks his practice by scientific help shows that with the facts of soil food, and that plants require so much of them to produce certain results under certain conditions, we must respond to their teachings, and allow value accordingly for any form of materials which are known to possess so much of the properties that go to sustain soils and build up crops—also of known value.

In submitting a few figures upon this subject I prefer the plain rule arrived at from recent conclusions here and elsewhere in cattle feeding, that the value of the manure during the feeding process is equal to half the value of the finished animal:—

Final Balance.

Values brought forward	$773 00	
Value of 6,300 bushels roots		$567 00
Pea straw, 46 tons		184 00
Attendance, half time of one man		100 00
Value of manure from fattened shearlings	517 00	
Estimated value of manure from ewes	150 00	
	$1,440 00	$851 00
Balance to credit		589 00
		$1,440 00

In any form, therefore, we obtain a handsome return, even allowing still further for the value of the pasture. Surely such facts ought to impress themselves and bring about a speedy change.

3.—Cream and Butter from Different Breeds of Cows.

We have all to bow to the fact that it is the machine more than the materials that regulates the quality of the milk of most animals. This seems to hold good practically in all parts of the world, whatever the variations in condition of climate, food and management, with the better known pure breeds of cattle, yet little is known in regard to what certain crosses of these can do under like circumstances. So, having this in view, as well as the checking of the work of others and the establishment of data for ourselves, we undertook an experiment during last winter on this most valuable subject:

The cows set aside for the purpose were—

1.—A pure-bred Ayrshire.
2.—A pure-bred Shorthorn.
3.—A pure-bred Hereford.
4.—A pure-bred Aberdeen Poll.
5.—A Shorthorn grade.
6.—A Hereford grade, 2nd cross.

As the experiment was not a question of quantity of milk, the difference in the condition of the cows or their time since last calving is not so serious an objection as may appear on first thoughts. The food given consisted of :—

Cut :	Oat and Wheat Straw,	6 lbs.
	Corn Stalks	4 "
	Hay	2 "
		12 lbs.
	Turnips and Mangolds (pulped)	60 "
	Pea Meal.....	2 "

in equal quantities to each per head per day in three meals. The times of milkng were at 6.30 a.m. and 6 p.m., by the same hands during the whole course.

In the management, record was kept of

1. Temperature of stables.
2. Quantity of milk by *weight* and *measure*.
3. Specific gravity of milk previous to setting.
4. Temperature of milk before setting.
5. Temperatnre of dairy.
6. Time of setting.
7. Testing quality of cream by tubes.
8. Manner of setting—shallow or deep.
9. Time given for cream to rise.
10. Weight of cream removed.
11. Condition of cows.

The experiment began on 21st January, and ended the 28th April, 1880, with an interval of students' holidays at Easter.

We shall first tabulate the results from a carefully calculated mean of the various points affecting cream and butter.

Cream and Butter from different Breeds of Cows at the Ontario Experimental Farm.

BREED.	Specific gravity of Milk. Water—0.	Percentage of Cream in 24 hours. (Tubes.)	Weight of Cream from 100 lbs. Milk.	Percentage of Butter from Milk and Cream, by weight.		Percentage of Dried Curds from Skimmed Milk.
			lbs.	Milk.	Cream.	
Ayrshire	1030	6.12				10 00
Shorthorn	860	12.35			30.00	7.50
Hereford	910	7.87	5.43	2.01	50.25	10.60
Angus or Aberdeen Poll...	1110	8.52	7.76	3.72	40.00	10.60
Shorthorn grade	1030	12.65	5.43	2.31	46.00	12.50
Hereford grade	1060	13.71	6.46	2.54	40.50	
Means	1000	10.20	6.27	2.64	41.35	10.24

In analyzing this table it is interesting first to notice the difference in what is called the specific gravity of the milk from animals of different breeds, and for that mattter of it, of different animals in the same breed. If the lactometer is a true indicator of the weight of milk relatively to distilled water, and if weight indicates thickness or creamyness, then the higher the figures in the first column the richer should be the milk in question. In this example we have the following :—

Order of Richness of Milk by Specific Gravity :

1. A. or A. Poll 111
2. Hereford grade. 106
3. Shorthorn grade. ..... } 103 equal.
4. Ayrshire. ..... }
5. Hereford 91
6. Shorthorn. 86

See Diagram Fig. 1.

But this graduated piece of glass would register the same and higher figures, were certain foreign matters introduced into the milk, or were the milk adulterated with water and these matters, so that no reliance can be placed upon such a form of ascertaining either the purity or richness of milk. Of course, here, all the milk was *pure*, and consequently it may be assumed that the instrument did indicate some sort of relative properties in the milk as compared with pure water. Are we to conclude that the famous beefing Shorthorn used a much larger proportion of the fattening or solid matters of her food in maintaining her constitution by as much as 25 out of 111, and in these respects is there no difference between the milking Ayrshire and beefing Shorthorn grade?

The Hereford also ranges low in this indication, but its cross with a grade rises to the second place among the six. We may see, as we advance in this inquiry, whether any reliance can be placed on specific gravity.

Another point of much value, especially to those who now send cream in place of the sweet milk to the creameries, is what is shown in the second column of the table. In our plan of work, creamometers were used to test the percentage of cream that would rise during twenty-four hours. The tubes were filled every day for the whole period of three months, and all conditions, such as temperature, were properly attended to. As regards a certain *column*, or body, of cream rising in a given time, I have no doubt of the accuracy of this test of the different breeds, and to illustrate the result I beg to add the following diagram, which shows the relative proportions more strikingly :

See Diagram Fig. 2.

A large volume of cream does not necessarily imply a corresponding quantity of butter, any more than high specific gravity denotes quantity of cream, but when cream is sold by bulk, as is now the increasing practice in the management of creameries, it is evident that some regard should be paid to the kind of animal giving the milk, and the time given the cream to get to the surface. The creamery will not, I presume, object to the farmer allowing his milk to stand over twenty-four hours, so long as its sweetness is not destroyed, because the last cream is always the heaviest and best for the butter maker, but, if there is no corresponding thickness of buttery materials in, for example, the Shorhorn, as compared with the Hereford, then he will soon find that in paying as much for the one as for the other, all the while that the Shorthorn may be, as we shall see, forty per cent. less in the property of giving butter from cream than the Hereford, he is paying sixty-six per cent. more for the Shorthorn milk than he is for the Hereford milk. The milk of the pure-bred Ayrshire is apparently not half so rich as either that from the Shorthorn, Shorthorn grade, or Hereford grade, and is twenty-five per cent. less than the Hereford and Aberdeen Poll, and forty per cent. less than the mean of all. The Ayrshire, then, may not be the best breed for the creamery, and certainly if there is only an approximation to the truth in this matter of cream volume in the different breeds of cattle, the immense difference of 124 per cent. that the Hereford grade shows over the Ayrshire

is enough to give rise to serious thought on the part of both the farmer and the creamery man. Meantime pass to another view of the subject.

See Diagram Fig. 3.

The difference of weight of equal bulk of the like materials is evidence of their containing different proportions of the same constituents, and in our case of milk from various breeds of cattle, should guide us in arriving at cream volume, or value. I am sorry to be unable to submit the Shorthorn and Ayrshire in this respect, because of some irregular conditions at churning times. In the case of the four others we have the Aberdeen Poll in advance with forty-three per cent. over the Hereford and Shorhorn grade (which are equal), with twenty-four per cent. over the mean of all. Observe the exact agreement between the weight of cream and the specific gravity of their milk, as thus illustrated:

See Diagram Fig. 4.

If then, the weight of cream agrees with the produce of butter in each case, we may be led to place some reliance on specific gravity after all—that is to say, when the milk is pure.

What butter then, have we received from the several creams, and what has been its proportion to the original milk.

See Diagram Fig. 5.

There is no agreement, or rather, there is a diverse agreement, between the proportion of butter from a given quantity of milk to that of butter from a given quantity of cream. The Poll, with its $3\frac{3}{4}$ lbs. nearly of butter from 100 lbs. of milk, gives the lowest, or 40 lbs. of butter from 100 lbs. of cream; while the Hereford with only its 2 lbs. fully of butter from 100 lbs. of milk, gives as much as $50\frac{1}{4}$ lbs. of butter from the like quantity of cream.

See Diagram Fig. 6.

It appears, therefore, that in every case where the weight of butter is low relatively to the quantity of milk, the weight of butter from the cream of that milk is correspondingly high. Here then, is valuable guidance for farmers, dairymen, and creamerymen; for example, in sending milk to the creamery the farmer is credited with the average proportion of cream that rises from all the milk, so that if the average be $2\frac{2}{3}$ lbs. of butter from every 100 lbs. of milk, the while that the creamerymen obtain $41\frac{1}{3}$ lbs. of butter from every 100 lbs. of cream, there is something in getting milk from different breeds of cattle.

On an average of breeds we find that

Every 100 lbs. of milk give $6\frac{1}{4}$ lbs. of cream;
Every 100 lbs. of cream give $41\frac{1}{3}$ lbs. of butter;
Every 100 lbs. of milk give $2\frac{2}{3}$ lbs. of butter;

I beg to ask the dairy expert if the quantity of dried curd from skimmed milk is any indication of the cheese value of the milk, and therefore of the particular breed? If it is, we have in our experience, not much extended however, to record merit as follows:

Best,	Shorthorn grade	giving	12.50	per	cent.	of curd.
2nd,	A. or A. Poll	"	10.60	"	"	"
3rd,	Hereford	"	10.50	"	"	"
4th,	Ayrshire	"	10.00	"	"	"
5th,	Shorthorn	"	7.50	"	"	"

Comparative Abstract and Result of Butter and Cream from Different Breeds of Cattle.

We are dealing with what we know to be pure milk from cows of different breeds, and in looking over the various tests used in our winter experiment, I have to acknowledge the great attention given the whole subject by Messrs. Howitt and Holterman, second year students, to whom was intrusted the carrying out of the details. Every part of their work was characterized by punctuality, care, correctness, cleanness, and a thorough in-

terest. No fewer than 4,000 observations had to be actually made and recorded by them in the course of eighty days, and thus the public will be able to appreciate the value and reliability of this experiment, so far as it goes.

It is interesting to note the very large range in the specific gravity of these milks; two such famous beefing breeds as the Shorthorn and Aberdeen Poll differ by as much as 35 in the 100. British experiments give the average of their breeds as 103—water being 0. Using this as a comparison we have our Ayrshires, and Shorthorn grade exactly at their standard, the pure Hereford at 91, and the pure Shorthorn down to 86—the whole five breeds giving a mean of 99⅜ in winter and 99⅜ in summer. Of course we do not forget that individual cows vary much, and that the same cows might give different results under different management in another part of the country. If, however, there be trust in specific gravity, the Aberdeen Poll is 35 per cent. better than the Shorthorn, and considerably over all the others; even the two grades are at and over the British standard, and much superior to the Hereford and Shorthorn. However, specific gravity is but one thing. The next natural test, following that of purity, or, in our case *density*, is the quantity or volume of *cream* from a certain weight or measure of milk—measure in this example. In Britain this is set down at 10.01, that is, every 100 lbs. of milk gives 10 lbs. of cream. At our farm we have the Hereford grade leading, with as much as 13¾ lbs. of cream to every 100 lbs. of milk, the Shorthorn grade second, with 12⅔ lbs., the pure Shorthorn 12⅓ lbs.; the Aberdeen Poll only 8½ lbs.; the pure Hereford 7⅞, and the Ayrshire lowest with, 6⅛ lbs—all over an average of 10.20. The Hereford grade and Shorthorn grade have kept their places well; the pure Shorthorn has advanced a great deal, but the Aberdeen Poll is now far behind—not even up to the mean. We have then clear proof that specific gravity of milk does not necessarily imply *bulk* of cream.

Our third test was the actual weighing of the cream, as a step nearer the butter that may be got from each breed. In this we cannot present the Ayrshire and pure Shorthorn for reasons previously stated. Of the four reliable ones, the Aberdeen Poll again steps in with a lead of 7¾ lbs. of cream from every 100 lbsof milk; the Hereford grade again steadily in its place, and giving nearly 6½ lbs.; with the Shorthorn grade and pure Hereford in the third place, and equal, with nearly 5½ lbs of cream to every 100 lbs. of milk.

Here we are at last in possession of some agreement. The specific gravity of the milk and the actual weight of the cream from the same milk correspond as illustrated in Fig. 4.

But the housewife says,—come to the best possible test, or what weight of butter do you get from a certain weight of cream?

From every 100 lbs. of cream we obtained 50¼ lbs. of butter in the case of the pure Hereford; from the Shorthorn grade 46 lbs. of butter; from the Hereford grade 40½ lbs. of butter, and from the Aberdeen Poll 40 lbs. of butter from every 100 lbs. of cream. This true test of richness and value of milk has considerably changed the places of the respective breeds; the Aberdeen Poll and Hereford grade, that have been so high in previous records, are now at the bottom of the list in this, while the Hereford and Shorthorn grade are very much higher, though they stood lowest in most other things.

Therefore, the *weight* of cream for a certain weight of milk does not imply a corresponding weight of butter. Indeed so exactly are they reversed in our experience that doubts may be entertained of their correctness; but this, I need hardly say, is not the case, as all figures have been carefully checked by the two superintendents, as well as by myself.

It will interest some to know what per cent. of butter by weight we obtained from the milk of each breed. This is shown in Fig. 6—placing the Aberdeen Poll first with 3.72 per cent.; the Hereford grade second, with 2.54; the Shorthorn grade third, with 2.31; and the pure Hereford last, with 2.01 lbs. of butter from every 100 lbs. of milk, or exactly in agreement with the weight of cream from milk, as in Fig. 3.

Finally, we are now in possession of every kind of data, except one, by which to estimate the annual value of a cow of each of these breeds for dairy purposes. We want the average production of milk under like food in a given time. Looking to the future for this, we are able meantime to tabulate the value of one cow of each on the assumption that each will give 4,500 lbs. of milk within the twelve months; price of

butter, say 18 cents per pound. In regard, therefore, to actual value of milk for production of butter, without reference to quantity of milk, we have to conclude meantime, that the Hereford grade is first, the Aberdeen Poll second, the pure Hereford third, and the Shorthorn grade last.

See Fig. 7.

Canadian Experience.

Value of Butter from equal quantities of Milk, from various Breeds of Cattle. Say 4,500 lbs. of Milk per annum, and Butter 18 cents per lb.

BREED.	Weight of *Cream* from *Milk*.	Weight of *Butter* from *Cream*.	Value of Butter per Annum.
	lbs.	lbs.	
Hereford Grade	290	145	$26 10
Aberdeen Poll	350	141	25 40
Hereford	245	123	22 10
Shorthorn Grade	245	112½	20 70

Any further evidence in favour or against a particular breed, will depend, therefore, upon QUANTITY of milk per annum. Taking the extreme, in a herd of 50 cows, the difference would be $300 in favour of the Hereford grade.

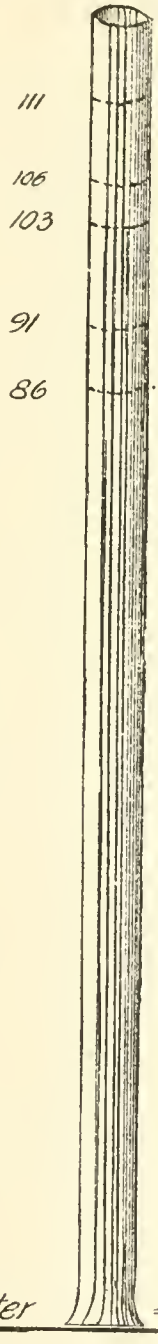
Milk and Cream from "Soiling" and Grazing of Cows.

It was considered well to make a beginning in this in order to gain experience for something more extensive in the future. It being known that the quantity of milk depends upon food and breed, and quality upon breed more than food, the conditions affecting plants and animals, especially in regard to weather, have much ado with such experiments. The lengthy drought we had during June and August would therefore be in favour of "soiling," as the pastures were very much withered and short, while we had, by special arrangement, always a good cut of some kind of green fodder for the housed cows.

On the 6th June the 2nd year students selected six cows from our herds as nearly equal in points as possible—such points having reference to breed, frame, markings, and condition. None were in high milking condition, and hence we had no rush in either in-door or out-door management. The soiling food consisted principally of lucerne, rye (green), clovers and tare and oat fodder, of which they got 110 lbs. per head per day, at three meals, stall-tied, and getting to water and a few minutes' exercise once a day. The dissatisfaction of the three housed cows was very apparent, which could not of course be by reason of want of company, and may then be assigned to the unusual conditions at such a season. Milking was done morning and evening. The three grazed cows had the usual run of cultivated and uncultivated pastures, were driven home for milking, and therefore received no special attentions whatever. Milk was tested with thermometer, lactometer, creamometer, and specific gravity bottle—*i.e.*, weighing in place of floating. The first stage of the experiment extended to forty days,—the second stage to twenty days,—the cows being changed after allowing one week's interval with the view to counteracting previous conditions.

SPECIFIC GRAVITY of Milk
from different breeds of Cows

FIG 1.



CREAM BY VOLUME — from different breeds of Cows

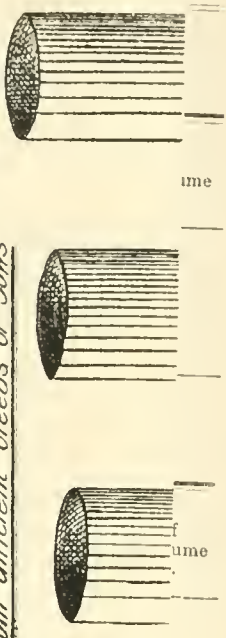


FIG 2.

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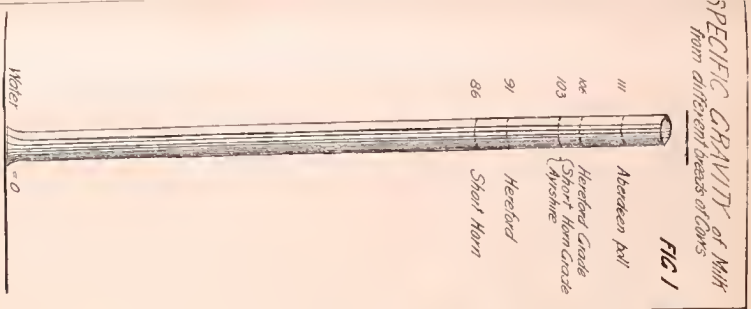
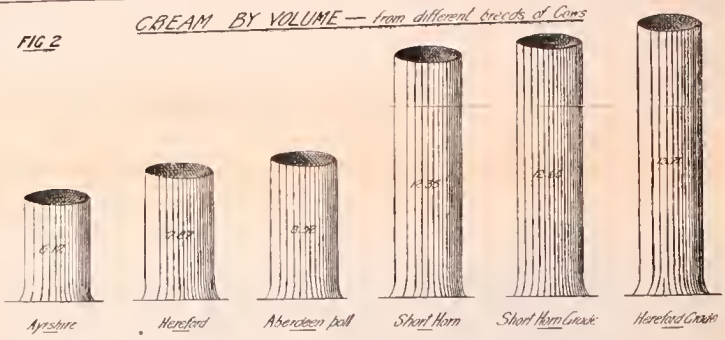
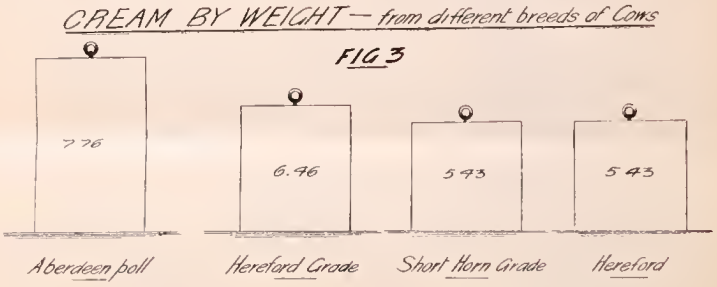
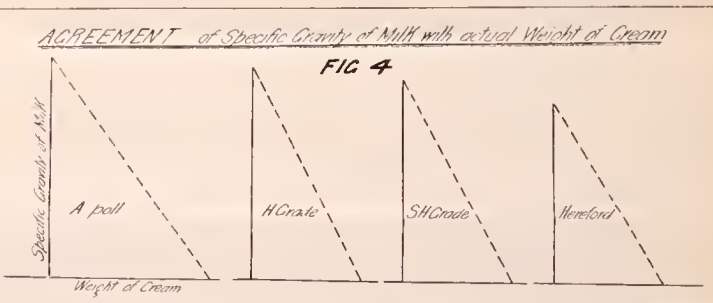
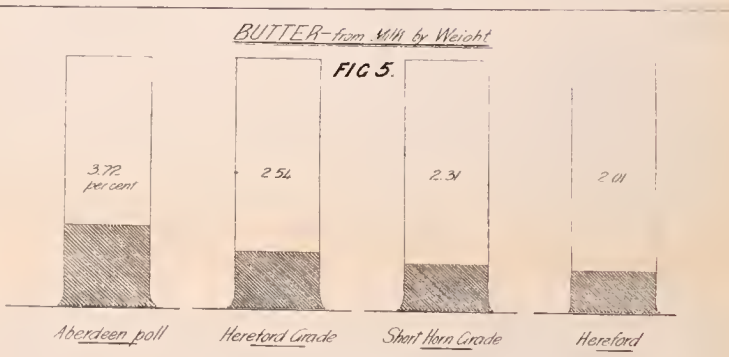

SPECIFIC GRAVITY of Milk from different breeds of Cows
Water
1.0
86
91
103
111
Short Horn
Hereford
Hereford Grade Short Horn Grade Ayrshire
Aberdeen poll

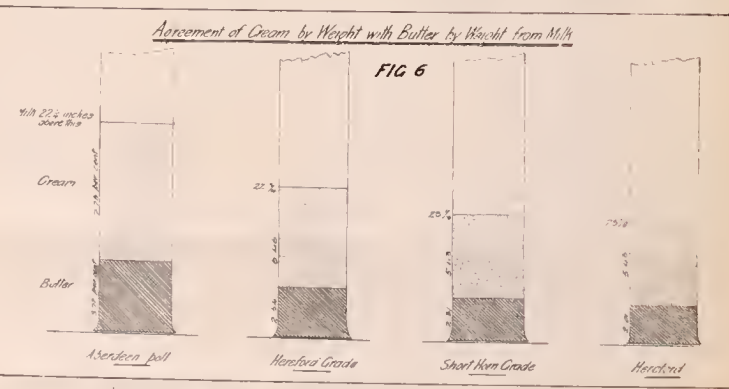
FIG 1

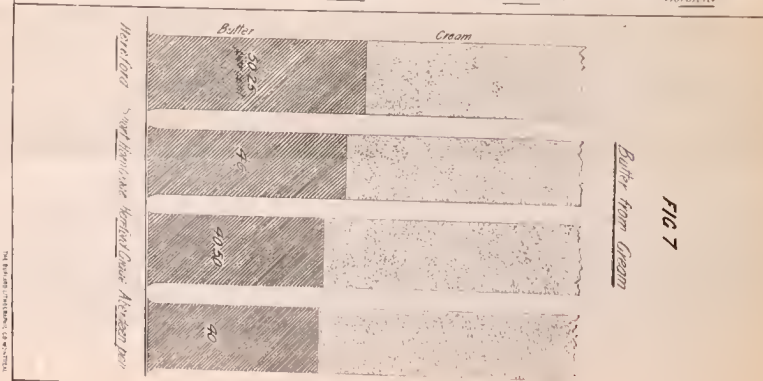

CREAM BY VOLUME — from different breeds of Cows
FIG 2
Ayrshire
Hereford
Aberdeen poll
Short Horn
Short Horn Grade
Hereford Grade


CREAM BY WEIGHT — from different breeds of Cows
FIG 3
7.76
6.96
5.43
5.43
Aberdeen poll
Hereford Grade
Short Horn Grade
Hereford


AGREEMENT of Specific Gravity of Milk with actual Weight of Cream
FIG 4
Specific Gravity of Milk
A poll
H Grade
SH Grade
Hereford
Weight of Cream


BUTTER — from Milk by Weight
FIG 5.
3.72 per cent
2.54
2.31
2.01
Aberdeen poll
Hereford Grade
Short Horn Grade
Hereford


Agreement of Cream by Weight with Butter by Weight from Milk
FIG 6
Milk 22½ inches Skim Milk
Cream
Butter
Aberdeen poll
Hereford Grade
Short Horn Grade
Hereford


Butter
Cream
Butter from Cream
FIG 7

RESULT FROM 6TH JUNE TO 16TH JULY.

MANAGEMENT.	Milk in Quarts per Day.	Specific Gravity by Lactometer.	Per cent. of Cream by Volume in 24 hours.
Grazing	$7\frac{3}{16}$	98.30	10.20
Soiling	$6\frac{3}{16}$	101.20	10.03

RESULT FROM 26TH JULY TO 13TH AUGUST.

MANAGEMENT.	Milk in Quarts per day.	Specific Gravity by Lactometer.	Per cent. of Cream by Volume in 24 hours.
Soiling (the cows grazed above)	$5\frac{5}{16}$	99.53	9.03
Grazing (the cows soiled above)	$5\frac{1}{16}$	99.75	10.26

In this simple statement we have such evidence of great uniformity in the milk of various cross breeds of cattle that the first natural conclusions are in favour of the plan of selection, and that the selection itself was well done; further, that the quantity and quality of the milk are so even, with two exceptions, as to make the question of food influence being little in these examples yet more decisive. The quantity kept so regularly apart in both stages, even by the reversion of the cows, that no doubt need be entertained in this instance of the power of the constitution to digest and regulate on the one hand, as against the kind and quantity of food doing so on the other hand. The same cows that gave the largest quantity by grazing in the first stage, gave also the largest by soiling in the second stage, and those that gave the smallest by soiling in the first, gave the smallest quantity by grazing in the second stage. I do not say that conditions were not favourable to such a result, for the latter part of the second stage (in August) was against the grazing, but then the same cows gave also least under soiling previous to that, and so we are entitled to look at least as much to the machine as the food for this uniformity.

We have elsewhere (see "Cream and Butter from Different Breeds of Cows") in this report, given satisfactory evidence of the value of the lactometer in indicating quality of milk, and so, building upon this, we have to note quite a difference in the specific gravity of the milk during the first stage of this experiment, and practically now for the second, with a slight figure in favour of one set of cows giving richer milk than the other (example, 101.20 and 99.75, as against 98.30 and 99.53 respectively). The cows changed from grazing to soiling, very slightly increased the quality of their milk, and those from soiling to grazing decidedly reduced the quality. But this indication of quality does not necessarily show what *volume* of cream may be produced, for both specific gravities give about the same percentage of cream during twenty-four hours (10.20 and 10.03), which, however, differs by 1.23 per cent. in the case of the cows taken from grazing to soiling (9.03 and 10.26).

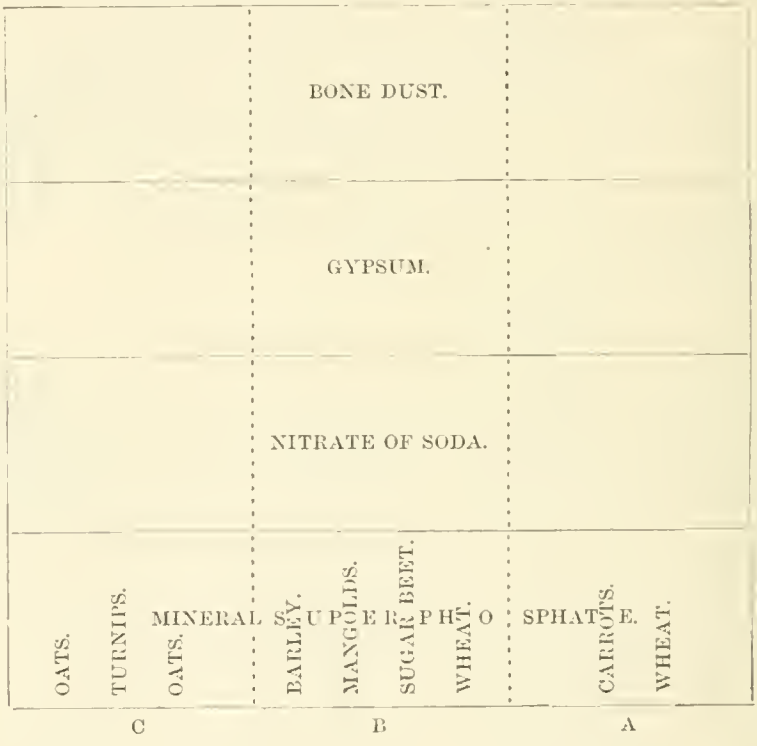
GRAZING then, was slightly superior to soiling in amount as well as richness of produce.

THE EXPERIMENTAL.

B.—The Field.

5.—The effects of Bone Dust, Gypsum, Nitrate of Soda and Mineral Superphosphate applied in 1878. (Plot 29, Field C.)

Our 1878 and 1879 reports should be read before this, although the subjoined cropping list will give an idea of what is being aimed at :—



1876. Bare summer fallow.
1877. Bare summer fallow.
1878. Manures as above supplied to Oats and Barley.
1879. Carrots, Sugar Beets, Mangolds, and Turnips.
1880. Wheat, spring variety, and Oats.

Years 1876 and 1877 were preparatory by bare summer fallowing ; in 1878 the manures were applied, 600 lbs. of each, except nitrate of soda, which was limited to 300 lbs. at same time, with wheat, oats, and barley ; in 1879 crops of carrots, sugar beets, mangolds, and turnips were taken, and this year one of White Russian spring wheat and White Blade oats. In place of following up, in detail, the results of this year's cropping, we will aggregate for the period of three years, and draw some conclusions :—

Three years' cropping after Special Fertilizers—all weights in pounds. (Plot 29, Field C.)

Manures.	1878.				1879.				1880.				Total result in quantities per acre for 3 years.
	Oats.		Barley.		Carrots.	Sugar Beet.	Mangolds.	Turnips.	Wheat.		Oats.		
	Straw	Grain	Straw	Grain	lbs.				Straw	Grain	Straw	Grain	lbs.
Bone Dust ...	2820	382	2760	436	48600	45120	30240	16080	1320	280	2800	840	151678
Gypsum	2400	765	2340	480	37440	27840	22500	13080	760	240	2360	760	110965
Nitrate of Soda	3960	765	3240	552	39360	37680	25360	18000	640	180	2560	1040	133337
Mineral Superphosphate ..	2700	956	2580	600	38160	31440	28800	16080	1040	300	3040	960	126656
	11880	2868	10920	2068	163560	142080	106900	63240	3760	1000	10760	3600	

An examination of this three years' table shows the following financial fact, taking $100 as the standard of the highest produce from bone dust.

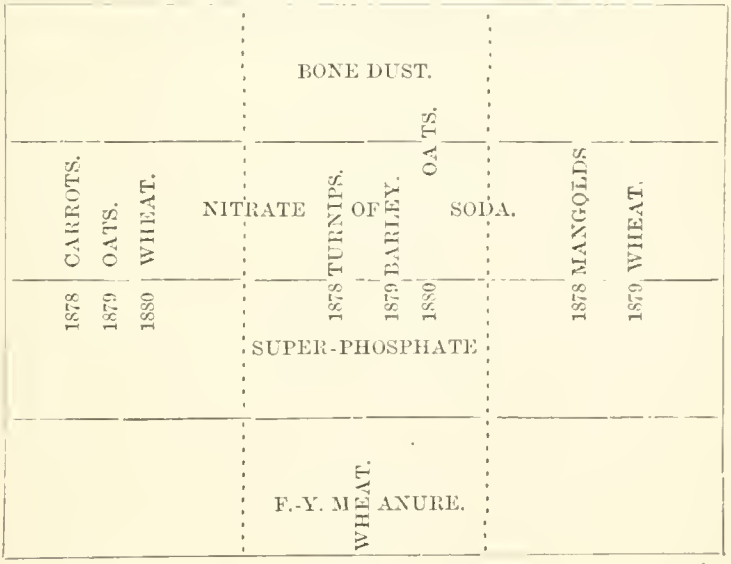
Bone Dust	$100
Nitrate of Soda	87
Mineral Superphosphate	84
Gypsum	73

Bone dust in a three years' trial is, therefore, twenty per cent. over the mean of all the others; or, on an average of crops, seven per cent. per annum.

Three years' cropping, after Farm-yard Manure and three Special Fertilizers. (Plot 36, Field C.)

This is a continuation of an important experiment begun in 1878, and all that can be called for this year is to tabulate and add up for the three-year period.

PLOT 36, FIELD C.



The cropping and manuring has been :—

1876. Turnips, with Farm-yard Manure.
1877. Wheat, no Manure.
1878. Manure as above, with Mangolds, Turnips and Carrots.
1879. Wheat, Barley and Oats.
1880. Wheat and Oats.

Three Years' Cropping after Farm-yard Manure and three Special Fertilizers—all weights in Pounds. (Plot 36, Field C.)

	1878.			1879.						1880.				Total results in quantities per acre for three years.
	Mangolds.	Turnips.	Carrots.	Wheat.		Barley.		Oats.		Wheat.		Oats.		
				Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	
Farm-yard Manure	48,480	19,440	30,480	2,800	780	5,040	1,584	4,400	1,974	1,040	95	2,400	960	119,473
Mineral Superphosphate	45,600	16,560	31,800	2,560	680	2,800	1,360	3,280	1,622	960	140	2,360	880	110,602
Nitrate of Soda	52,200	1,680	33,840	2,640	720	2,960	1,520	4,240	1,785	960	70	2,360	800	105,755
Bone Dust	34,800	1,920	32,400	2,560	720	3,040	1,280	3,840	1,360	560	20	2,040	800	85,340

The examination here shows the financial result, with the highest as $100 for easy comparison, to be :—

Farm-yard Manure	$100
Mineral Superphosphate	91
Nitrate of Soda	88
Bone Dust	71

Farm-yard manure, during a three years' trial, is therefore seventeen per cent. over the average of mineral superphosphate, nitrate of soda and bone dust, or, nearly six per cent. per annum.

The Effect of Manures upon Wheat—Second Year. (Field C, Plots 10, 11 and 12.)

Were the production of crops experimentally a matter of profit, we would hear little about experiments, or were the continuance of experiments to hinge upon large produce per acre, the special profession would be equally barren. When, from a season such as we have passed through, the ordinary farm management has given 19 and 22 bushels of spring wheat per acre, and that from experimental work by the like kind of grain, only an average of $6\frac{1}{2}$ bushels, as in the example now to be considered, the ordinary reader, untaught to value the line of our work, must necessarily doubt the use of its existence.

In order to follow best through this account, it is necessary to gather up from previous reports, where it is shown that these plots were subdivided into eighteen parts, and treated with various manures as follows :—

X.		XI.		XII.	
4 F.-Y. Manure and Superphosphate.	F.-Y. Manure and Superphosphate. *a*	4 Salt	1 Bone dust.	4 F.-Y. Manure and Salt.	I F.-Y. Manure and Salt. *a*
5 Superphosphate.	2 F.-Y. Manure.	5 F.-Y. Manure and Bone dust.	2 F.-Y. Manure and Bone dust. *a*	5 F.-Y. Manure and Gypsum.	2 F.-Y. Manure and Gypsum. *a*
6 Nitrate of Soda.	3 No Manure.	6 F.-Y. Manure and Nitrate of Soda.	3 F.-Y. Manure and Nitrate of Soda. *a*	6 Gypsum.	3 Lime Compost.

The plan shows three plots, 10, 11 and 12, of one-tenth of an acre each, sub-divided into eighteen, so that we have to deal with one-sixtieth of an acre in each of these experiments. The manures and quantities used in 1879 were :—

Farm-yard Manure, 26 loads	(of 2,000 lbs.) per acre.
Superphosphate (mineral)	400 lbs. "
Nitrate of Soda	200 " "

Bone Dust	400 lbs.	per acre.
Salt	400 "	"
Gypsum	400 "	"
Compost, 26 loads	(of 2,000 lbs.)	"

We have these separately, as also, with the exception of compost, all in duplicate association with farm-yard manure, making seventeen distinct applications—that without any manure completing the list. The farm-yard manure was got from covered hammels where young cattle were being suckled by their dams visiting twice daily, and fed on cut fodder of corn, straw, and hay, with a mixture of bran, corn meal, and a little oilcake; the superphosphate was the ordinary kind from Belleville; bone dust from Toronto manufacture, well ground and not new; salt from Goderich; gypsum (land plaster) from Paris, and the compost of our own making from two years' gathering of experimental vegetable refuse mixed with one of lime to seven of itself.

The duplicating of farm-yard manure with the five purchased fertilizers was primarily for the purpose of testing to what extent they would be affected—for good or bad—by admixture *one month previous to application*, that is on the 1st April, 1879, while the others were left to the 28th, or immediately before ploughing and seeding.

As in 1879, the crop in 1880 was spring wheat, White Russian variety, and we shall first tabulate its conduct during season of growth.

Plot.	Sub-division.	MANURE.	Perfection being 10. Condition on July 12th.	Condition at Harvest.	Rust.	Tillering.	Length of Straw.	Strength of Straw.
X.	1	F.-Y. Manure and Superphosphate (*a*)	7	7	7	8	8	8
	2	F.-Y. Manure	8	8	7	8	9	8
	3	No Manure	6	6	6	7	8	8
	4	F.-Y. Manure and Superphosphate	6	7	7	8	8	8
	5	Superphosphate	3	2	6	5	8	8
	6	Nitrate of Soda	4	4	6	6	8	8
XI.	1	Bone Dust	5	5	7	6	8	8
	2	F.-Y. Manure and Bone Dust (*a*)	6	7	7	8	9	8
	3	F.-Y. Manure and Nitrate of Soda (*a*)	6	6	7	7	9	8
	4	Salt	5	5	7	7	8	8
	5	F.-Y. Manure and Bone Dust	4	3	6	5	7	8
	6	F.-Y. Manure and Nitrate of Soda	5	5	6	6	8	8
XII.	1	F.-Y. Manure and Salt (*a*)	5	6	7	8	8	8
	2	F.-Y. Manure and Gypsum (*a*)	5	7	7	9	8	8
	3	Compost	5	8	7	8	9	8
	4	F.-Y. Manure and Salt	8	8	7	8	8	8
	5	F.-Y. Manure and Gypsum	8	8	7	8	8	8
	6	Gypsum	7	8	7	8	8	8

The condition of the crop during the early part of July varied very much, as will be observed. That upon superphosphate and nitrate of soda was particularly poor; very many of the sub-divisions did not show over five marks out of the ten, and only three reached eight. These three were farm-yard manure alone, and farm-yard manure associated with salt and gypsum respectively.

So again, when at maturity, these extremes of condition maintained their own in the case of the best, but fell off in that of the poorest, and when we take the unmanured plot as our guide with its fair mark of 6, there is surely ground for questioning the good from the use of superphosphate and nitrate of soda, as well as others, singly or in combination, upon wheat.

But rust was worst on these poorer crops, as also where no manure was given, and

in the case of the poor result from combinations of farm-yard manure with bone dust and nitrate of soda, this disease seemed to be as bad.

The vigour of a plant is evidenced in one way by sending up numerous shoots from the one seed, or what is called tillering; the best example of this was from farm-yard manure and gypsum combined, and one of the poorest from superphosphate.

Strength and length of straw were most prominent from farm-yard manure, compost, and the association of bone dust and nitrate of soda with farm-yard manure.

Yield of Grain and Straw per acre, with quantity of Small Grain.

Plot.	Sub-division.	MANURE.	Grain.	Straw.	Small grain.
			Bushels.	lbs.	Bushels.
X.	1	Farm-yard Manure and Superphosphates (*a*)	7	1,740	2½
	2	Farm-yard Manure	13½	8¼	1,860	3½
	3	No Manure	13½	8¼	1,440	1¾
	4	Farm-yard Manure and Superphosphate	11½	5	1,470	2½
	5	Superphosphate	14	3½	870	1½
	6	Nitrate of Soda	16	5¾	960	1½
XI.	1	Bone Dust	16	5¼	1,260	2
	2	Farm-yard Manure and Bone Dust (*a*)	19½	6¼	1,800	2¾
	3	Farm-yard Manure and Nitrate of Soda (*a*).	23	8¼	1,920	1¾
	4	Salt	17½	4½	1,200	2
	5	Farm-yard Manure and Bone Dust	22½	4	1,200	1½
	6	Farm-yard Manure and Nitrate of Soda (*a*)	23	7¼	1,560	2½
XII.	1	Farm-yard Manure and Salt (*a*)	20	5¾	1,935	4
	2	Farm-yard Manure and Gypsum (*a*)	21¼	7½	2,190	3½
	3	Lime Compost	20½	8½	2,100	3¼
	4	Farm-yard Manure and Salt	20	6¾	2,160	3½
	5	Farm-yard Manure and Gypsum	20½	7	2,040	3
	6	Gypsum	17½	6¼	1,680	3¼
		Means	18½	6½	1,616	

The result, to the average practical farmer, may be called a failure, but to such as ourselves, and therefore to the more careful weigher of causes and effects, the conduct of this second years' crop of wheat upon land manured in 1879, cannot fail to be interesting. If the blight formerly referred to was the main reason for such a small average yield as 6½ bushels per acre, it must be borne in mind that on such a small area as one-tenth of an acre, having one aspect and one physical condition of soil all over, any atmospheric affection would be uniform *unless influenced by conditions brought about by the manures applied.* We start, therefore, with the clear understanding that variations in amount of grain and straw have been caused directly or indirectly by character of manure. There is such a large falling off in produce from 18½ in 1879 to 6½ bushels in 1880, as at once to raise the question whether it is not owing more to climatic causes than to condition of soil, and thus we must look to comparative facts for confirmation of the position I take, that while it is so unquestionably, yet the manurial influences were the strongest.

For example, the lowest produce last year was from farm-yard manure, and that without manure—this year both are second highest among the eighteen examples, the only one a shade better being from compost. Why then does farm-yard manure, and particularly the plot unmanured, give 90 per cent. more grain and straw this year than that (superphosphate 3½) which produced as much as 14 bushels last year? I take the two extremes for the stronger argument.

I must confess, however, to much surprise at the *continued equal position* of the grain and straw from farm-yard manure, and from that which got no manure, thus:

	1879.		1880.	
	Grain.	Straw.	Grain.	Straw.
Farm-yard Manure	13½	3,810	8¼	1,860
Without Manure	13½	3,270	8¼	1,440

Taking, first, the unmanured result as the only safe base for comparison, it is plain that the falling off in its case from 13½ to 8¼ bushels is owing to one of two, or to the two causes combined, of weather, and exhaustion of soil; if more to exhaustion, then why have we a crop in 1880 from the unmanured equal to that from farm-yard manure? Does the farm-yard manure still give straw only and not increase of grain? for as will be readily observed, not only was the straw in 1879 14 per cent. more from the farm-yard manure, but it is also 23 per cent. more in 1880 than the unmanured land.

Another distinct feature of the experiment is the result from pure mineral fertilizers:—

	1879.		1880.	
	Grain.	Straw.	Grain.	Straw.
	Bushels.	lbs.	Bushels.	lbs.
Superphosphate	14	3,120	3½	870
Nitrate of Soda	16	3,840	5¾	960
Salt	17½	3,030	4¾	1,200
Gypsum	17½	3,090	6¼	1,680
Means	16¼	3,270	5⅛	1,178

Here, again we must look to the unmanured returns for comparison with these, and note first that while superphosphate in 1879 gave practically the same result (½ bushel more), it has fallen off to such an extent in 1880 that twice the seeding only was obtained, and hence nearly five bushels less than the unmanured. Why less than the unmanured? Has harm resulted directly, or through combination of weather influences to the crop? because we are surely allowed to argue that if no superphosphate had been applied to this particular plot, which is contiguous to the other, a crop equal to the unmanured one would have been obtained. Harm of some sort must have, or has, resulted from the application of this mineral fertilizer; not only did the first crop not make use of it, but the second has succumbed directly or indirectly to its influence.

The nitrate of soda in 1879 gave a little more grain and a great deal more straw than the unmanured, but the falling off in 1880 of both straw and grain is very large. Indeed, it is evident that the immense rush of straw in 1879 took with it much, if practically not all, the fertilizing properties of this salt, if any was left, it did no good and, probably some harm.

Common salt alone was advantageous last year to the extent of four bushels per acre over the unmanured, with corresponding straw; this year there is neither grain nor straw within 250 per cent. of itself, nor 200 per cent. of last year's unmanured.

Last year gypsum alone stood equal to salt, but this year it is 26 per cent. better, both in grain and straw; and again I must impress the fact that here is further proof of the weather not having had all to do with these results. Were the salt and gypsum of equal fertilizing powers, in their continuance, the record now would not be so wide as it is with these minerals.

What now of the behaviour of these pure minerals, in *combination* with farm-yard manure?—

	1879.		1880.	
	Grain.	Straw.	Grain.	Straw.
	Bushels.	lbs.	Bushels.	lbs.
F.-Y. Manure and Superphosphate	17	3,770	6	1,605
F.-Y. Manure and N. of Soda	23	4,000	7¾	1,740
F.-Y. Manure and Salt	20	3,420	6¼	2,047
F.-Y. Manure and Gypsum	21¼	3,040	7¼	2,115
Means	20¼	3,532	6¾	1,877

Those least last year hold exactly the same relative position this year, in the order of:

Superphosphate .....17 and 6
Salt .....20 and 6¼
Gypsum.....21¼ and 7¼
Nitrate of Soda.....23 and 7¾

Altogether, however, a very uniform yield in grain, the straw from farm-yard manure and gypsum being superior, and very much reduced in quantity in the cases of superphosphate and nitrate of soda.

The highest result in grain, and one of the best in straw, was from lime compost, which last year also gave one of the best returns.

The most striking fact in all these returns is, that, not only last year, but this year, the yield of wheat from unmanured land was largely over the mean of all the manured ones, in the face of the other fact, that the soil cannot be called rich, naturally or artificially, as evidenced by the average produce of almost 11 bushels of grain per acre (13½ and 8¾).

We are called upon to conclude, at this stage of this experiment, that much of the soils of Canada is yet in no need of special fertilizers, even when they are partially exhausted, and that the best method of recuperation is by systematic rotation of crops, and the liberal use of farm-yard manure.

8.—The effects of 19 Varieties of Manures on Wheat, as applied to Turnips in 1879.
(Part of Farm, Field No. 9.)

This, the second year of a very varied experiment to test the permanency of various manures, alone and in combination, by a rotation of cropping, has exhibited results as interesting as last year, meagre as has been all cropping in comparison with the like wheat on the same field by our regular field rotation, which, let me at once say, was 19½ bushels per acre.

Plot.	MANURES.	Grain per Acre.	Straw per Acre.	Small Grain per bushel.
		Bushels.	lbs.	lbs.
5	Farm-yard Manure	9⅓	1280	4
2*	Gypsum	7⅓	960	5
19	Salt	6	720	4
1	Gypsum and Mineral Superphosphate	6	700	5
7*	Bone Dust	5⅓	880	3½
6	Bone Superphosphate and Bone Dust	5⅓	720	7
10	Bone Dust and Salt	5⅓	820	6½
9	Bone Superphosphate and Salt	5⅓	720	14
16*	Bone Superphosphate and Mineral Superphosphate	4⅔	640	6
14	Mineral Superphosphate and Salt	4⅔	660	16
20	Nitrate of Soda	4	460	5
18	Lime	3⅔	540	5
12	Bone Superphosphate	3⅓	640	4
8	Mixture of all 2, 7, 12, 17 and 19	3⅓	500	4
17	Mineral Superphosphate	3⅓	520	2½
4	Bone Dust and Gypsum	2⅔	480	4½
3	Bone Superphosphate and Gypsum	2⅔	460	3½
15	Gypsum and Salt	2⅔	640	8½
13	No Manure	2⅓	400	4
11*	Mineral Superphosphate and Bone Dust	2⅙	400	9
	Means	4⅔	657	6

Ere criticising this table, I beg our readers will peruse the introductory remarks to the chapter herewith on plots 10, 11 and 12 of field C, and be assured that we are looking for something besides weight of produce per acre in this experimental search of finding what certain manures or plant fertilizers do under equal conditions during a series of years.

Here, the story last year, was a crop of turnips, as a start with these nineteen forms, with a result as regards produce in the following order.

ORDER OF MERIT BY AMOUNT OF PRODUCE IN 1879.

Largest—Farm-yard manure.
Mineral superphosphate and gypsum.
Bone dust and salt.
Bone superphosphate and mineral superphosphate.
Mineral superphosphate.
Bone dust and gypsum.
Bone superphosphate and gypsum.
Bone superphosphate and salt.
Bone superphosphate and bone dust.
Mineral superphosphate and salt.
Bone superphosphate.
Mixture of 2, 7, 12, 17, and 19.
Mineral superphosphate and bone dust.
Bone dust.
Gypsum.
Salt.
Lime.
No manure.
Gypsum and salt.
Least—Nitrate of soda.

The first striking fact in the cropping of 1880 is that *Farm-yard Manure* is again far in advance of all others, fully four times the lowest from mineral superphosphate and bone dust, and double the mean of all.

Gypsum is second this year, as against its fifteenth place last year, a result very gratifying, and evidence of more permanency than many of us are inclined to grant to this mineral.

Salt was in the very low position of sixteenth last year—it is now third, and equal to a combination of gypsum and mineral superphosphate. Salt, immediately to roots, has had a much superior effect on a succeeding crop of wheat than upon the roots themselves.

The *Gypsum and Mineral Superphosphate* hold nearly an even position each year—second last year and fourth this year, among nineteen competitors.

Bone Dust alone is now working its way up the permanent scale—from fourteenth last year to fifth this year.

Associated with *Bone Superphosphate*, *Bone Dust* is also advancing steadily, being now sixth as against ninth last year.

Bone Dust and Salt, in the third place last year, has now gone down to the seventh, a combination not equal to the separate results of these fertilizers.

We have *Bone Superphosphate and Salt* in exactly the same place both years—eighth.

This year *Bone Superphosphate and Mineral Superphosphate* have descended from the fourth to the ninth place in this matter of quantity of produce.

Bone Superphosphate and Salt make very little difference in their story this year as against that of 1879.

Nitrate of Soda came out lowest of all last year, and it will surprise some to note how it has risen nine steps in the making of wheat during 1880. There was no rush of straw, but a comparatively low yield of it.

Lime has followed nitrate of soda as regards advance in relative position—from seventeenth to twelfth.

So again, *Bone Superphosphate* alone gives an even account of itself—on the whole low, but keeping its place.

The *Mixture* (of gypsum, bone dust, bone superphosphate, mineral superphosphate, and salt) is also in agreement with its previous conduct.

Mineral Superphosphate made a good record last year, having stood fifth, as we would expect with roots, but to wheat it is comparatively indifferent, standing as low as fifteenth among nineteen.

Our somewhat prominent fertilizers, *Bone Dust and Gypsum*, in their single effects, do not maintain their record when associated, nor are they nearly up to their first year's place as a combination.

Bone Superphosphate and Gypsum are this year seventeenth, or ten places below that of 1879.

Gypsum and Salt seem to be a poor combination in any case—so much so that the chemist will have to say why.

Last year the plot that received *no manure* was better than gypsum and salt combined, as well as nitrate of soda alone; this year it is not yet at the bottom, being superior to a mixture of mineral superphosphate and bone dust.

Therefore, *Mineral Superphosphate and Bone Dust* have fallen from the thirteenth place to the twentieth, or lowest of all.

9.—*Five Years' Experience of Thirty Three Forms of Fertilizers.*

Five years' experience should be of some value in this matter. Facts should now be accumulating in our farm practice, and special experiments, from which indications, at least, if not reliable conclusions, ought to be gathered in regard to the fertilizing properties of what are called manures—singly, and in combination with each other. Appended, therefore, find a complete table of what we have realized during the last five years throughout some 2,000 trials from ten of our most common farm crops.

The natural question is, what can be gathered from these for the use of the average farmer? I think several important facts:—

1.—That many varieties of fall wheat with twenty tons per acre of good farm-yard manure have given an average of 41 bushels per acre.

2.—That our ordinary farm practice of sending all manures through the root division

of the rotation has resulted in 18 bushels of spring wheat; 47 of oats; 34 of barley; 1¾ ton of hay; 836 bushels of mangolds; 705 of turnips; 614 of carrots, and 162 of potatoes.

3.—That farm-yard manure, without any other help, has given us 19 bushels of spring wheat; 48 of oats; 34 of barley; 895 of mangolds; 450 of turnips; 666 of carrots, and 255 bushels of potatoes per acre.

4.—In association with lime, salt, bone dust, nitrate of soda, gypsum, and mineral superphosphate, farm-yard manure produces 20 bushels of spring wheat on an average, but the effects for the second and third years were comparatively little.

5.—Five kinds of mineral fertilizers, in their single effects, made an average of 16 bushels of spring wheat per acre, with a rapidly reducing result after the first year.

6.—Mineral fertilizers gave 22 bushels of barley, and 26 of oats.

7.—In fifteen different forms, singly, and in association, these mineral fertilizers gave 290 bushels of turnips per acre on an average.

And thus, all over, any one may continue this kind of analysis from the table.

Five Years' Experience of Thirty-three Forms of Fertilizers upon Ten Kinds of Crops, Representing over 2,000 Experiments.
All Quantities in Bushels.

Manures.	Fall Wheat.	Spring Wheat.	Oats.	Barley.	Hay.	Mangolds.	Turnips.	Carrots.	Sugar Beet.	Potatoes.	
Farm-yard Manure, Fall application	41	20				988	451	724			
Farm-yard Manure, Spring application		18	48	31		793	450	608		255	
Farm-yard Manure and Lime			42					382			
Farm-yard Manure and Salt		20									
Farm-yard Manure and Bone Dust		22									
Farm-yard Manure and Nitrate of Soda		23									Once.
Farm-yard Manure and Gypsum		21									
Farm-yard Manure, Salt and Bone Dust						939					
Farm-yard Manure, and Mineral Superphosphate		18				275		175			
Farm-yard Manure, Superphoshate, Gypsum and Salt						365	521	290		128	
Farm-yard Manure, Gypsum, Bone Dust and Salt		18	47	34	1 4-5 tons.	836	705	614		162	Farm practice.
Bone Dust		14	26	19		521	406	675	752		
Bone Dust and Salt							350				
Bone Dust and Bone Superphosphate							300				
Bone Dust and Mineral Superphosphate							245				
Bone Dust and Gypsum		11					306				
Lime							131				
Lime Compost		21									
Sewage						978			1735		Two years.
Salt		18		20		755	145				
Mineral Superphosphate		17	39	27		692	354	583	524	193	
Farm-yard Liquid and Lime		17									
Nitrate of Soda		14	38	27		646	632	610	628		
Gypsum		18	23			541	216	624	464		
Gypsum and Leeched Ashes			41								
Gypsum and Salt							67				
Gypsum and Mineral Superphosphate							353				
Gypsum, Bone Dust, Bone Superphosphate, Mineral Sup. and Salt							279				
Bone Superphosphate							275				
Bone Superphosphate and Mineral Superphosphate							333				
Bone Superphosphate and Salt							303				
Mineral Superphosphate and Salt							269				
Apatite											1st year.
Detroit Potato Grower										199	Once.

10.—*Apatite upon Fall Wheat.*

This was undertaken by desire of the Dominion Government, who sent the material with instructions as to mode of application, per J. Gemmell, Esq., of Ottawa.

Three plots, contiguous, and as nearly equal as possible in all essentials, were laid off in field 8, on the 20th October, 1879.

On plot 1, about 20 tons of farm-yard manure were applied per acre ; on plot 2, on the 29th October, 500 lbs. of apatite per acre, and the like quantity on the 27th May was applied to the crop ; and plot 3 got no manure of any kind ; result as follows :—

Manure.	Produce Per Acre.		Small grain per acre.	Weight per bushel.
	Grain.	Straw.		
	Bush. lbs.	lbs.	Bush. lbs.	lbs.
Farm-yard Manure	33 35	2,015	1 15	59
Apatite	29 15	1,750	.. 45	59
No Manure	29 5	1,740	.. 35	58

The wheat was the Clawson, or Seneca ; previous crop pease, and the soil had received no fertilizer for seven years except 200 lbs. of gypsum to hay in 1876—thus in good trim for such a trial. The small grain is included in the total quantity per acre.

The practical observant reader will note several points in favour of this mineral fertilizer, with a probable better record next year.

11.—*Produce of Roots at Various distances apart on the Drill.*

Many of our most intelligent farmers still doubt the fact, well known to the experimentalist at least, that the nearer bulbs are cultivated to each other the greater the produce per acre, and that there is a limit to this ; the fact is indisputable, but as it is one thing to make the assertion and another to give proof, we have again made a careful trial with a variety of mangolds—the result is thus tabulated :—

	Distance apart on the Drill.	Average Weight of Bulbs.	Bushels per Acre.
	Inches.	lbs.	
Red Globe	6	1·531	729·20
"	12	1·823	578·40
"	18	2·862	627·40
"	24	3·742	611·20
Long Red	6	1·777	896·00
"	12	2·345	760·40
"	18	2·976	597·20
"	24	2·400	385·20
Long Yellow	6	1·506	805·00
"	12	2·000	620·40
"	18	2·563	562·21
"	24	3·285	536·40
Yellow Globe	6	1·881	851·40
"	12	1·941	613·40
"	18	4·553	998·40
"	24	3·781	564·40

	Distance apart on the Drill.	Average Weight of Bulbs.	Bushels per Acre.
	Inches.	lbs.	
Improved Mammoth Long Red	6	1·915	872·40
" "	12	2·656	830·40
" "	18	3·959	868·00
" "	24	3·785	618·20
Carter's Warden Prize	6	1·651	828·20
" "	12	2·924	672·00
" "	18	2·851	625·20
" "	24	3·343	546·00
Red Intermediate	6	1·771	868·00
"	12	2·144	690·40
"	18	3·170	695·20
"	24	3.114	508·40
Long White Sugar Beet	8	2·523	1148·00
"			
" "	12	4·143	1169·00
" "			
White French Sugar Beeet	42	5·690	531·00

Drills were 28 inches apart in all cases, and of course all were similarly manured and cultivated, on soil as nearly alike as possible.

An examination of the table shows that out of the 31 examples there are but five instances in which there is not a large decrease in produce per acre from the close distances to the wider distances apart between plant and plant up to a certain point. The five exceptions are the Red Globe at 12 inches, the Yellow Globe at 18 inches, the Improved Mammoth Long Red at 18 inches, the Red Intermediate at 18 inches, and the large White Sugar Beet at 12 inches, and these may have been brought about by extra favourable circumstances unknown to us. But before discussing the whole question, let us analyze these figures by another table:

Mean produce at different distances apart—plant to plant.

	Average weight of Bulbs.	Average produce per acre.
	lbs.	Bush.
At 6 inches	1.720	836
" 12 "	2.262	652
" 18 "	3.276	710
" 24 "	3.350	538
Mean	2.652	684

At six inches apart from plant to plant on the drill, therefore, we obtain an average bulb of $1\frac{3}{4}$ lbs. weight and 836 bushels per acre; at 12 inches apart the bulbs attain to $2\frac{1}{4}$ lbs. each, and give only 652 bushels per acre; at 18 inches apart bulbs rise to $3\frac{1}{4}$ lbs. and return 710 bushels per acre; and at 24 inches from plant to plant the bulbs reach the very larger average of $3\frac{1}{3}$ lbs., but produce only 538 bushels per acre.

Now, in the first example, there are but two exceptions to the fact that the produce

per acre is 34 per cent. larger than the mean of all the other forms of production; as much as 30 per cent. over those of 12 inches; as much as 18 per cent. over the large yield of 710 bushels at 18 inches apart; and no less than 56 per cent. more than the 24-inch ones. We had a fine braird of plants all over, and fairly favourable conditions throughout, as evidenced by the good average of 684 bushels per acre.

So, then, the question is, Why thin out to any other distance than that of about 6 inches? All we want is room to cultivate with the horse hoe, and here, permit the remark, that, were it possible to do so safely and thoroughly at 8 or 12 inches between drills, in place of 28 inches as in this case, it is almost safe to say that the produce would be at least *one-third* more, that is to say, the 836 bushels would have been 1,100.

Leaving this latter point for another occasion, it is our duty to note another important fact in this experiment:

We have seen that, between the 6 and 18 inch spaces, there is a large falling off in produce per acre, (not per bulb remember), and that there is a large increase from the 12 to the 18. It is plain from the figures that this increase arose from the weight of individual bulbs, nearly 3⅛ lbs. each. Had we had this size of bulb at 6 inches apart the yield would have been 1,666 bushels per acre. But very large bulbs, or bulbs that increase gradually in size, as space is allowed between the plants, does not imply a corresponding increase per acre; as to this, note that while at 24 inches the bulbs rise to fully 3½ lbs. each, the produce is reduced to 538 bushels. There is then a limit to *wide* distances between plants; eighteen inches are too much, because at 6 we have 18 per cent. more; if the bulb would increase proportionately at 9 inches apart, as we obtain it from 1¾ to 2¼, the produce would be 817 bushels; twelve inches are either too much or too little, and thus the question lies between small bulbs and large bulbs. When we are able to tell if there be any difference, and what, if any, in the nutritive value of large as against small bulbs, we will be in a position to choose the growing of either; but until it is shown that the large is superior to the small, to such an extent as to give more feeding value *per acre* than those from 6-inch distances, it is plain that, if we want the *bulk* per acre, we should secure plants at or about 6 inches in the row. It may be that smallness gives more toughness or woodiness than the medium and larger roots, and that *fibre* is not so nutritive as flesh in this case.

The sugar beet cultivation in the first table is not included in the foregoing results. With reference to them it will be noticed that there is practically little difference in weight per acre between 8 and 12 inches plant to plant, the while that the 12 inches give bulbs 80 per cent. larger than the other. Here again *numbers* give weight. A very extravagant extreme is shown in the case of the White French sugar beet. These, thinned out to 42 inches between plant and plant, on drills 28 inches wide, give the very large average of 5¾ lbs. per bulb, and the very small produce of 531 bushels per acre.

12.—*An early catch of Mangolds and Carrots.*

On 29th October, 1879, land was manured with twenty tons of farm-yard manure, and ploughed under. On 15th April seeding was well done in drills twenty-eight inches apart. Brairding was irregular on 24th May, by reason of unfavourable weather, and by 22nd June, Mangold leaves from opposite drills were meeting. No late frosts interfered. On 12th July bulbs of Mangolds were three inches in diameter, and Carrots one inch.

Result.

Long Red Mangolds, 1070 bushels per acre.
White Belgian Carrots, 901 " " "

13.—*Grasses and Clovers.*

Italian and Perennial Rye grasses sown in 1878 are now disappearing—white cloves taking their place. There has been a self re-seeding to some extent. On the borders of the sewage ditch these grasses are strong and rank, and holding better than anywhere else.

In 1879 we seeded with "Carter's mixture of grasses and clovers for clay soil." The appearance on 1st April, 1880, was very doubtful; on 24th May there was a good show of common trefoil and white clover, but little else. June gave the heaviest sward of alsike, red, white and trefoil clovers in all our experience, with a few plants of the rye grasses, which latter improved very much by November.

Sweet Vernal grass laid down in 1878, is now all off its old site, but some plants from self-seeding have done fairly well in shelter among other grasses.

What we got as *Bent*, variety not named, and seeded in 1878, is doing well, gave a cut of short hay, with little after math.

The Crested Dog's Tail (1878) is practically a failure.

Red Top is equal to timothy—thick and fine, but offers little pasture after cutting.

Meadow Fescue (1878) is also very good, comparable with timothy, gives good pasture, less bunchy and finer than timothy and orchard.

Kentucky Blue grass (1878) is a close sward all over.

Fan-oat grass, (1878). A very fine crop, gives good hay and very good pasture.

14—*Potatoes in Field 17.*

The land was prepared as for sowing mangolds, except that the salt, bone dust, and superphosphate was applied after the drills were made.

Potato sets were planted eight inches apart, in drills twenty-eight inches apart, on May 28. Covered by splitting the drills with a plough.

June 14th.—Harrowed with a light harrow to kill weeds and break down drills.

June 30th.—Hoed with horse and hand hoe.

July 9th.—Earthed up with a horse hoe.

October 15th.—Potatoes taken in and weighed.

VARIETY.	Bushels per Acre.		REMARKS.
	Bus.	lbs.	
Brownell's Vermont Beauty	112	56	Large tubers.
Eureka	199	44	Very good, uniform, medium size.
Brownell's Superior	143	44	Small, unsound.
Compton's Surprise	122	16	Small, poor.
Perfection	112		Small.
Late Rose	161	28	Very fair tubers.
Snowflake	160	32	Small.
Peerless	173	36	Largest and best tubers, fewest small one
Early Ohio	151	12	Fair size.
Alpha	51	20	Very small.
Extra Early Vermont	179	12	Rough, fair size.
St. Lawrence	193	12	Medium size.
Success	191	20	Rough, medium size.
Average of 13 varieties	150	11	

15.—*Green Fodders.*

LUCERNE, FIELD A.

Laid down in 1877, one-half broad cast and the other half in drills.

May 11th, 1880.—The broadcast starts more rapidly in the spring than the drills; at this date it stands six inches high and we cut three tons per acre. It has been severely upheaved by the frost, about half being killed. It does not grow so strong as last year.

June 12th.—Top-dressed with well rotted farm-yard manure eighteen loads per acre and harrowed in.

July 12th.—Horse-hoed and harrowed the drills and re-seeded broadcast, so as to save labour in keeping the drills clean.

Nov. 11th.—The drills are now much stronger than the broadcast, or the re-seeded part.

July 12th.—Has produced plants four inches high.

DATE OF CUTTING.	BROADCAST.	DRILLED.
May 20th	6,020 lbs.	3,400 lbs.
September 26th	4,050 "	6,020 "
October 21st	2,970 "	3,240 "
	6½ tons.	6⅓ tons.

PRICKLY COMFREY.

Planted in 1879, three feet apart each way. On April 5th, 1880, it was starting to sprout.

April 24th.—This is the first green fodder of the season, being ahead of lucerne. It is not in the least injured by the severe winter.

We took the first cutting on May 11th, and on May 24th it was ready to cut again, and sending out seed stalks.

July 7th.—Top-dressed with rough manure, 15 loads per acre.

DATE OF CUTTINGS.	WEIGHT.
May 11th	1¼ tons per acre.
June 1st	2¾ " "
July 2nd	2¼ " "
October 1st	3½ " "
Total	9¾

Spring Rye.

This plot was manured, twenty loads per acre, with farm-yard manure, and fall ploughed in 1879.

April 26th, 1880.—Gang-ploughed, harrowed, and drilled with spring rye, two bushels per acre, and seeded with red clover, forty pounds per acre. On May 24th, it looked very fine, better than tares and oats, and growing very thick.

June 14th.—*Cut ten tons per acre*, green. It could have been used on June 1st.

Oct. 1st.—The clover on this plot looks as well as that on the plot next to it, which was sown without any other crop.

Tares and Oats.

The land for these was prepared the same as for spring rye.

April 26th.—Sowed first batch, equal parts of tares and oats by measure, two bushels per acre in all.

June 14th.—Made second sowing, two bushels per acre.

July 6th.—Cut first sowing as plants were begining to head out, they would have given a fair cut three weeks ago.

Aug. 20th.—Cut second sowing. The oats were poor and rusty.

July 6th.—First cutting $8\frac{1}{4}$ tons per acre.

Aug. 2nd.—Second cutting $2\frac{1}{4}$ tons per acre.

Sainfoin.

The land was prepared the same as for spring rye.

April 28.—Sowed sainfoin thirty pounds per acre.

June 15.—Seed has not germinated well.

July 1st.—The weeds are getting so much ahead of the sainfoin as to threaten the destruction of the sainfoin entirely; we mowed weeds to keep them from seeding.

Oct. 1st.—The sainfoin is now beginning to push and spread.

Nov. 11th.—It is growing much better now and spreading, and is not yet in the least injured by frost.

Indian Corn.

The land was prepared the same as for spring rye, ploughed and harrowed on June 14th.

June 15th.—Sowed Indian corn with drill, two bushels per acre.

Aug. 11th.—Cut green corn *nine tons per acre*, plants being short.

Rape.

This plot was manured from the farm-yard, and ploughed in the fall of 1879.

June 14th, 1880.—Ploughed and harrowed.

June 18th.—Sowed rape on drills, four pounds per acre.

August 5th.—The rape was long enough to pasture with sheep, and on August 11 was long enough to give a good cutting.

August 19th.—Cut first cutting of rape, $6\frac{1}{4}$ tons per acre.

October 22nd.—Cut second crop of rape, 4 tons per acre, making a total of $10\frac{1}{4}$ *tons per acre.*

Thousand-Headed Kale, or Tree Cabbage.

The land was prepared at the same time and in the same way as for rape.

June 18th.—Sowed kale the same as rape seed; as soon as the plants were large enough they were singled and cultivated like turnips.

September 25th.—We cut a part of the plot, which gave 4½ tons of green feed per acre.
October 22.—Cut the balance of the plot, which gave 11½ tons per acre.

Lucerne, Field C, Plot 18.

This plot was sown in drills in the spring of 1876 (see former reports).

May 24th 1880.—Two thirds of this crop is gone, either from the severe winter or from natural exhaustion. The plants are heaved four inches and rotten in the centre of the stalk. What plants are left are growing vigorously.

June 25th.—Loosened the soil well with horse hoe, harrowed, and sowed lucerne, forty pounds per acre, broadcast and rolled.

July 10th.—The young plants have made a good start and look well.

October 30th.—This crop has grown wonderfully long, thick and tender, and yielded a cutting of *six tons per acre*, which was fed to sheep; they like it and thrive well on it. When sown broadcast it grows more tender, and stock prefer it better than that cut from the drills. The leaves are more easily injured by frost than red clover.

16.—*Permanent Pasture, Field C., Plot 33.*

The rotation of crops on this plot has been as follows:

In 1876, oats, no manure.

In 1877, wheat, farm-yard manure, 30 loads per acre; and gypsum 200 lbs. per acre.

In 1878, April 23rd, seeded with a mixture of grasses and clovers, that are sown separately on plot 34, forty pounds per acre, and manured with a mixture of all our artificial manures (see 1878-9 reports).

1880, April 5th.—This plot looks well and would make better pasture than any of our other pasture or meadow fields. The clovers, and especially the great strong wedgy roots of lucerne have been badly heaved by the frost.

May 22nd.—Put four rams to graze on one-half of the plot for seven days. They were also fed one quart of grain per day, so that at this date the pasture was able to support eighty sheep per acre, for seven days, along with half a pint of grain per head per day.

May 25th.—From the other half of the plot we took grass equal to one hundred pounds of hay, and this would have kept two sheep for a week.

May 29th.—Removed two sheep and put the other two where the grass was cut Lucerne grows rapidly and sheep eat it first.

June 5th.—Let two rams have the run of the whole plot.

June 12th.—Took sheep off.

June 22nd.—Put four rams on for four days.

The lucerne shoots ahead of the other clovers and grasses, and grows fine and tender, sheep are very fond of it and eat it down first.

July 10th.—Put four rams on for three days.

Lucerne, white, and trefoil clovers are doing well, also orchard, fan-oat, meadow fescue, English rye, and rib grasses. No doubt there are other kinds that cannot be distinguished among so many.

October 4th.—Put four rams on for two days.

November 12th.—Orchard grass is thriving, and at present is thickest and strongest; lucerne is also doing well, white and trefoil clovers, rib grass and meadow fescue are plentiful, the whole plot is covered with four inches of thick pasturage. Put six sheep on for one day.

The pasturage for the season, then, is equal to 112 days for one sheep, and would have kept four sheep for a week more, making 140 days for one sheep, *or over seven sheep per acre, from May 15th to November 15th.*

17.—*Barley in Field A.*

These plots were manured and ploughed in the fall of 1879, after a crop of oats had been taken off; gang-ploughed this spring, and seeded with barley on May 14th, two bushels per acre; and on May 15th seeded with grasses and clovers, thirty pounds per acre.

Carter's Chevalier, Potter's Prize, and Hallett's Pedigree, are two-rowed varieties, obtained from Carter and Co., London, England, in 1878; they are all very much alike. Russian Hulless is a two-rowed variety with fine, weak straw, got from Centennial Exhibition. Russian and Spring are six rowed varieties from the Centennial Exhibition, both good kinds. Thanet and Probestier are old varieties, the six-rowed is from the Centennial Exhibition, the grain is small and bright; the straw is very good, long and strong.

BARLEY OF 1880 PRODUCE.

VARIETY.	Appeared above Ground.	Condition on July 13th.	Condition at Harvest.	Strength of Straw.	Length of Straw.	Date of Harvesting.	Headed out.	Produce per Acre.		Small Grain per Acre.	lbs. per Bushel.	REMARKS.
								Straw.	Grain.			
								lbs.	B. lbs.	B. lbs.		
Potter's Prize	May 25th	*10	*9	*8	*9	Aug. 9th	July 13th	2,150	28 6	6 15	51	Two-rowed.
Carter's Chevalier	" 25th	10	9	8	9	" 9th	" 13th	2,750	35 6	6 32	52	"
Hallett's Pedigree	" 25th	10	9	8	9	" 9th	" 13th	2,775	32 6	7 19	51	"
Russian Hulless	" 23rd	9	8	8	8	July 30th	" 4th	2,420	35 0	1 32	61	"
Russian	" 25th	10	10	10	10	" 31st	" 16th	2,080	30 10	9 8	49	Six-rowed.
Spring	" 25th	10	10	10	10	" 31st	" 8th	1,690	22 14	1 12	49	"
Thanet	" 25th	8	10	10	10	" 31st	" 13th	1,560	31 12	5 0	49	Four-rowed.
Six-Rowed	" 24th	10	9	9	10	" 28th	" 10th	2,060	22 41	10 0	44	Six-rowed.
Probestier	" 25th	10	9	9	9	" 13th	" 11th	1,440	20 40	1 12		Two-rowed.
Average								2,103	28 24½		50¾	

*10 being perfection.

18.—*Oats.*

Any grain kept for four continuous years on the same farm, under the same management, similarly treated in every respect, and carefully judged and weighed every year, should give evidence of reliability or not. I now, therefore, beg to draw the attention of the Ontario farmers to the accompanying table of *thirty* varieties, and sub-varieties, of white and black oats, both branched and side, in which are submitted the condition of the crops when well up in growth in July, also at harvesting; the dates of heading out and of harvesting, with the average length and strength of straw, their conduct under rust and "smut," the quantity of small grain, weight per bushel, and the produce per acre in grain and straw. I repeat, that all these have been thoroughly tested by us, by using our own seed yearly for four years in succession, and accordingly some practical value should be gathered at this stage. One of the best evidences of good oats is thinness of skin, and is a quality particularly desirable in a warm climate; and as thinness of skin and little "point," are equivalent to greater weight per bushel, the column with this latter result deserves particular notice. The standard with us being 34 lbs. per bushel, it will be observed that out of the thirty kinds, but three are under weight, namely, the Swiss, French No. 2, and Poland, all black or brown. We can make nothing of this new "Swiss" oat that has of late made so much noise in Britain; it is always late, gives very poor grain, but is an immense stooler, and has been convenient as a green fodder during drought, by reason of its lateness and leafiness. Observe the prominent place held by the Australian and New Zealand white side oats: in 40 lbs. per bushel, the least of all others by a great deal in having least "smalls," and an average produce of over 34 bushels per acre, and 2,220 pounds of straw. The highest produce of any—over 52 bushels—is from the kind called Fort William, a black-branched oat, of fine quality, weighing 37 lbs. per bushel. Thus, those interested, should go over each in the table, and arn what he may not have in his own practice, and compare with what he does have.

Thirty Varieties of Oats during 1880.

Varieties of Oats.	Condition on July 9th.	Condition at Harvest.	Date of Heading.	Date of Harvesting.	Length of Straw.	Strength of Straw.	Rust.	Smut.	Produce Per Acre. Straw.	Grain.	Small Grain Per Acre.	Weight Per Bushel.	Colour.
									lbs.	bush. lbs.	bush. lbs.		
Sparable	3	8	July 18	Aug. 23	7	10	7	9	2,460	25 0	2 32	36½	Black.
Black Tartarian (Imported), "Side"	7	8	" 20	" 21	10	8	7	9	3,100	32 2	3 28	35	"
Black Tartarian "Side"	7	8	" 20	" 21	10	8	7	9	2,920	28 8	4 4	33	"
Swiss	3	7	" 23	" 23	8	8	5	9	2,970	10 30	2 22	24	Brown.
Bullmans, Charlottetown	7	8	" 13	" 12	9	8	8	9	2,760	41 16	6 16	35	Black.
Pale	8	9	" 13	" 12	10	9	9	9	2,400	26 21	5 5	32	White.
Side "Side"	9	9	" 13	" 12	10	9	10	9	2,780	32 32	4 29	34	"
Russia	6	9	" 23	" 12	9	9	7	9	2,140	31 14	4 24	39	"
Charlottetown	7	10	" 13	" 12	10	9	8	9	2,220	39 24	2 32	39	Black.
French, No. 2	3	7	" 18	" 23	7	10	5	9	1,940	17 22	2 2	33	"
French, No. 1	3	7	" 18	" 20	7	10	5	9	2,030	21 6	2 2	36	"
Norway	6	7	" 20	" 20	7	10	6	9	2,130	31 6	2 32	37	"
Australian "Side"	8	10	" 13	" 12	9	10	9	9	2,470	37 2	0 30	40	White.
New Zealand "Side"	7	10	" 14	" 12	9	10	10	9	1,970	31 6	1 6	40	"
Bullman's Black	7	8	" 12	" 9	9	8	9	9	2,950	39 24	2 2	37	Black.
Polland	7	9	" 18	" 23	9	9	8	9	3,940	33 18	3 30	33⅓	"
Spanish	9	9	" 8	" 5	9	8	10	8	2,720	35 30	2 32	38½	White.
Halifax	9	8	" 7	" 5	8	7	10	8	2,570	23 8	1 6	40	"
Barley (Ontario) (Birlie)	9	9	" 7	" 2	9	9	8	7	2,550	26 16	2 12	37	"
Barley (Iowa)	9	9	" 7	" 2	9	9	9	7	2,670	35 30	4 4	38	"
White Blade	9	8	" 7	" 2	8	9	10	7	4,600	32 32	2 32	40	"
Colorado	8	9	" 9	" 2	9	10	9	9	2,455	36 11	3 3	38	"
Hopetown, No. 1	6	8	" 9	" 5	8	10	8	9	2,630	44 4	3 18	36½	"
Hopetown, No. 2	9	7	" 9	" 2	9	7	9	6	1,405	34 9	2 7	39	"
Short	8	8	" 9	" 2	8	9	9	6	2,570	29 11	2 2	38	"
Surprise	8	7	" 9	" 2	9	7	9	8	2,990	36 26	2 12	40	"
Somerset	5	9	" 12	" 5	9	10	9	7	3,010	29 24	1 16	38	"
Colorado (Iowa)	9	8	" 9	" 2	8	8	9	9	3,040	41 6	3 8	36	"
White Straw	8	9	" 9	" 5	9	10	7	8	2,670	29 24	2 32	39	"
Fort William	8	7	" 11	" 13	9	8	7	9	3,280	52 7	4 4	37	Black.

Note.—Except those distinguished by "Side," all the Oats are of the "Branched" varieties. Conditions, and columns 6, 7, 8, 9, are judged by using 10 for perfection. The small grain is included in the total produce per acre.

The average produce of all is 33 bushels of grain and 2,683 lbs. of straw per acre, with a mean weight of 36 lbs. per bushel.

The value of each per acre is given in the following list, grain being reckoned at 34 cents per bushel of 34 lbs. and straw $6 per ton.

Value Per Acre of Grain and Straw from Thirty Varieties of Oats.

KINDS.	Grain in lbs.	Straw in lbs.	Value per acre.
1.—Fort William	1,931	3,280	$31 91
2.—White Blade	1,312	4,600	28 79
3.—Hopetown, No. 1	1,606	2,630	26 32
4.—Colorado (Iowa)	1,482	3,040	26 06
5.—Surprise	1,466	2,990	25 72
6.—Bullman's Black	1,467	2,950	25 61
7.—Bullman's (Charlottetown)	1,451	2,760	24 86
8.—Polland	1,123	3,940	24 65
9.—Spanish	1,377	2,720	23 90
10.—Birlie (Iowa)	1,360	2,670	23 55
11.—Australian	1,482	2,470	23 34
12.—Charlottetown	1,545	2,220	23 22
13.—Colorado	1,379	2,455	23 21
14.—Russia	1,340	2,440	22 63
15.—Black Tartarian (Imported)	1,122	3,100	22 12
16.—Somerset	1,126	3,040	21 96
17.—Side	1,120	2,780	21 34
18.—White Straw	1,155	2,670	21 17
19.—Short	1,116	2,570	20 47
20.—New Zealand	1,246	1,970	20 15
21.—Black Tartarian	932	2,920	20 01
22.—Hopetown, No. 2	1,335	1,405	19 46
23.—Norway	1,153	2,130	19 57
24.—Birlie (Ontario)	978	2,550	18 92
25.—Halifax	928	2,570	18 31
26.—Sparable	912	2,460	17 66
27.—Pale	853	2,400	16 95
28.—French, No. 1	762	2,030	14 80
29.—French, No. 2	583	1,940	12 48
30.—Swiss	270	2,970	12 09

Grain does not go by straw, nor straw by grain, necessarily. Observe in some cases such as White Blade, and Poland, that two, and two and one-third, tons of straw give 1,185 pounds of grain, or only one pound of grain to every three and a half pounds of straw; while others, such as Hopetown No. 2, and New Zealand give as much as one pound of grain to every pound of straw nearly. There is a very long reach from a value of $31.91 to $12.09 per acre; such a reach and such a variety of choice, either for grain or straw, that we are impressed with the fact of how much does lie in choice of the proper plant to get what is wanted. Who, for example, would think of cultivating Hopetown No. 2 for straw, were straw their object, and no one would prefer French No. 2, were bulk of grain the object? It may be considered a very good proportion when one pound of grain is got for every two pounds of straw—that is, thirty bushels of grain for every ton of straw. Examples, Colorado (*Iowa*), Surprise, Bullman's Spanish, and others.

Fort William is of average plumpness and medium skin, and is simply Black Tartarian under a new name, obtained, no doubt, while travelling recently; the head is long, somewhat open below, but grandly clad with grain on top.

White Blade is a beautiful sample of white oats, neither large nor small, though inclining to the small side; not remarkably plump, nor with a large barrel, but having no waste anywhere, and no *doubles;* it has a lengthy, branchy, compact head, standing well up.

Hopetown, No. 1, is more awny than the two described, prolonging the skin too much towards the blade end, and having quite a few doubles; it is the thick and medium lengthened head of this oat that gives the large produce per acre; branches are not long, and twigs not far apart. It is apt to shed its grain.

Colorado (*Iowa*), has a well balanced head, a little lengthy, with grain rather irregular in size.

Surprise is a well-known Canadian oat, short, of average plumpness, very regular in size, with a good length of head, and thick below; the weight per bushel (40 lbs.), is evidence of its fineness.

The two *Bullmans* may be classed together as regards grain, but with a preference to the Charlottetown variety for head; the berries are on the small side.

The oat called *Poland* gives grain very irregular in size, some large for a black kind, and some very small, and as will be seen, has the poorest record in quantity of smalls per acre; the head is of medium length, branches short and not well loaded.

The *Spanish* variety is a beautiful oat in head and grain, the grain is particularly nice, no undue skin, awn, or slack bosom, and but for a few small berries, would top the list.

Birlie (*Iowa*), is small, clean, bright, plump; a strong plant with a well filled head, and is not materially different in any respect from Birlie (*Ontario*).

The *Australian* side white variety of oats is a grand cropper, having medium straw and a compact head, not too long; the grain has not the appearance of weighing forty pounds per bushel, nor of being the best of all in giving least smalls, as the bosom is open and the blade end somewhat lenghty.

The *Charlottetown* side black has a bunchy head and a fair sample of grain.

Colorado, has a more delicate head than the Iowa variety of the same name, though the grain is rather better sampled.

Russia gives a thin branchy head with delicate branches, and a fair sample of grain somewhat small in size.

The *Black Tartarian* from Scotland, has kept up its size of berries well, but gathering more skin and a more open bosom, as the result of a warmer climate; hence it is only one pound over the standard weight; colour is maintained. The head is peculiarly bunchy and very neat. The Ontario variety of the same name (simply of a longer importation I presume) is much lighter in colour, and a very different head, being open and delicate in stalk and branches.

Somerset is one of our finest samples of white branched oats, both in plant and grain; grain even, plump, and bright, weighing well, and giving few smalls, the head strong, roomy, and well balanced.

The *Side*, is a side white, having a longish delicate berry, but a strong medium-sized head.

White Straw gives a plump oat of average length, therefore weighing well; the head is strong and airy with clean bright straw of medium strength and length.

Short, with us, means short plump grain, and a very even sample of good weight, with an average head, and rather delicate straw.

The *New Zealand* grain is better than the head indicates, which, for a side variety is rather delicate in appearance. Berries on the large sample, open bosom but with a fine plump kernel.

Norway is a brown coloured oat well up in sample and plant, and is deserving of more attention.

For beauty in colour, evenness of sample, weight per bushel, and few smalls, the *Halifax* white branched oat has few rivals.

Sparable is short and plump in the grain for a black; the dark is very decided, with white blade tips; head and straw somewhat delicate.

Pale has a lengthy narrow berry, and a long head, grain under the standard weight.

French.—Nos. 1 and 2 are poor varieties of the branched black.

The *Swiss*, as already stated, is as yet a failure, except in straw, the grain is changing in colour from gray to a dull white, and the head is open and badly filled.

19.—*The Growth of Nine Spring Wheats During 1880.*

KIND.	Straw per acre.	Grain per acre.	Weight per bush.	Value per acre.
	lbs.	bushs.		
Lost Nation ..... Bald	3,260	22 1-5	61	$32 30
White Russian ..... "	2,920	20	61	28 96
Rio-Grande ..... Bearded	2,550	19 1-5	60	26 85
Arnautka ..... "	2,340	17½	62	24 90
Champion ..... "	1,840	16⅛	60	21 68
White Fife. ..... Bald	1,530	13½	60	18 09
Rice or Goose..... Bearded	1,630	12½	59	17 27
Farrow ..... Bald	1,510	12 1-5	58	16 50
Gordon ..... "	1,360	10 1-5	59½	14 23

These are from the experimental plots, and have all been under trial since 1877, except Champion, White Fife and Gordon. We have now agreed to place Lost Nation and White Russian together as one wheat in straw, head and grain. Their conduct has been highly satisfactory ; true to kind, good croppers under a variety of conditions, no more liable to diseases than others, maturing in good time, tillering well, giving a fair amount of straw, and not bad to feed. Hundreds of farmers throughout the Dominion have bought several thousand bushels from us, and in no case have we heard of disappointment ; on the contrary we cannot supply the demand.

The *Rio Grande* is a medium bearded wheat, of good length of head, somewhat open, has been hardy, reliable to kind, with grain of average colour, and sample otherwise.

The *Arnautka* is already well known in some districts of the Province, being admired for its grand bold square head and beard, and grain perfect in colour as regards transparent brightness ; berries are large, oblong, with a flat bosom and highly flinty in structure. We have no experience of its milling qualities, but hear of appreciation as a strong one for mixing with others. The plant stools very poorly—not more than two or three per seed—and gives a third-class straw in quality, being pithy and weak at the neck. Its remarkable compact chaffy head is crowned with a thick beard six and seven inches in length.

The *Champion* is Rio Grande in appearance in head and straw, but having a shorter, lighter coloured berry. We still wait its magnificence.

The *White Fife* has a head superior to the size of berry it produces, but the berry is compact, though small, good coloured, and has produced considerably well ; the bosom of the berry is too open and deep ; it has the appearance of a good miller.

The *Rice or Goose* seems to me to be another name for Arnautka, or the Arnautka may have its origin from the Goose or Rice. The story is, that grain got from the crop of a wild goose, which had fed upon wild rice, was systematically cultivated until it attained its present form. We have had grain direct from the crop of a wild goose, which was long, flinty, bright in colour, and much like overgrown rye that has since by cultivation taken substantially the character of Arnautka, Rice and Goose wheat. The head of this Rice or Goose wheat is a smaller type than the Arnautka we have had from the States, and parts of Ontario.

Farrow or *Red Chaff*, has been a good cropper in Ontario for many years, but not a favourite with the millers. It is a reliable plant, requiring frequent change when off the limestone formations. Grain of a darkish hue, medium in size, and regular.

Gordon may be a renewed Fife—the good old Fife—or a larger form of the White Fife, or indeed but a new name to some such type of plant, set agoing by a pushing speculative party.

Altogether then, we have had much more success in the growth, establishment, and spread of spring wheats than we have had with winter varieties. All our physical conditions are in favour of these, and it is possible our bent has been more in this direction. I may mention that our field result of White Russian spring wheat for 1880 was over twenty-two bushels per acre, and none under sixty-two pounds per bushel.

VIII.—ARBORICULTURAL.

1.—The Ontario Farmers' Text Book.

We took up a text last year on this important subject, the substance of which stood thus :

1. Be your own nurseryman, by setting aside part of the garden to be laid with young trees from your own bush or that of your neighbour.

2. There are as many suitable plants in the uncultivated clearances of the country as would replant every cultivated acre of the old Provinces.

3. Do not grudge a piece of cultivated land for tree planting—the gain will be more than a grain crop, and in any case you can seed down to hay and permanent pasture.

4. The objects of planting, or replanting, are :

1. Immediate shelter.
2. Ornament.
3. To assist in regulating rainfall and general temperature.
4. As a profitable crop.

5. The best shelter is from fully developed trees standing at proper distances apart —not from a close body of branchless stems.

6. Ornament is secured only by allowing every tree room to grow in accordance with its individual character—never by crowding.

7. To assist in regulating rain-fall and temperature suitable to the wants of the country, we must have a national policy based upon scientific and practical facts in past arboricultural history.

8. Never plant trees upon naturally wet ground (our heaviest swamp sorts—so called —are upon comparatively dry spots).

9. Our native trees require no manuring, trenching, or breaking up of the surface, in preparation for replanting.

10. Spring planting is generally more successful than in the fall.

11. Choose mild, calm weather, between 1st April and 1st June.

12. Select plants from the clearings or unshaded openings in the bush, never from under older ones, and as much as possible from soil and exposure of a similar character to that to which they are to be removed.

13. Hardwood trees are safer to transplant than the pine and spruce.

14. The best sorts are maple, birch, beech, ironwood, ash, elm, butternut, oak, and hickory, with pine, spruce, and hemlock to intermix.

15. To save time and insure better success, remove the plants from the bush, or the public nursery, in October, and trench them close together, but separately, in dry soil, covering firmly with earth.

16. Before trenching, cut off any over-lengthy rough root, and branch, but take care of the small fibres and the top leader.

17. Avoid tall branchless trees that have been growing close together—a two or three feet one will do better than one ten or twelve feet it length.

18. In removing from the bush, dig all round before lifting; do not pull much nor shake off all the earth.

19. Never forget that drought is more dangerous than a little frost.

20. Two men in one day will dig up, waggon home, and trench in the garden nursery, as many as 300 plants from your own bush.

21. Choose calm cloudy weather, when the soil is moist, but not wet, for planting from the nursery.

22. Make the pits one-half wider and deeper than the roots require, and never plant deeper than one inch over the old mark on the stem.

23. Do not plant while water is in the pit.

24. If for a belt, or clump to shelter, plant not farther apart than seven feet in any direction.

25. The object of planting so close as seven feet (900 per acre) is to afford individual shelter, mutual support in several physiological relations, give plenty allowance for failures, and to thin out as required for purposes of profit and individual necessities of trees.

26. Two men should pit and plant 150 trees per day.

27. Spread out all fibrous roots in the pit, fill in the top or best loamy soil first, shaking the plant and gently pulling it up a little; when fully half the earth is in, tramp firmly with the foot, and finish up with the remainder of earth.

28. Use a variety of trees, not one or two species only, as the success will be more certain.

29. During the first season examine after high winds, and toe any openings round the plants.

30. Run no risks from animals or breaking by snowdrifts, and allow no sapplings or growths from the old stumps to interfere with those planted.

31. Sheep may be admitted to graze after ten years,—no cattle for twenty.

32. The second year is the trying one: you may have buds and leaves the first year, and a dead plant the second, if good the third year, congratulate.

33. Make good any deaths for the first three years, not afterwards.

34. Always have a few hundred plants ready in your garden nursery.

35. ever burn the grass among your trees, but use the scythe when too rank.

36. Never allow the drying of clothes on the young plants.

37. Do not prune the pine, spruce, or any of the resinous sorts.

38. Thin out the least valuable sorts, or those you do not wish to retain permanently, whenever they begin to interfere six inches into the branches of each other.

39. It is no over-calculation to say that where the influence of trees is needed, the gain, after fifteen years, will amount annually to $200 over a hundred-acre farm.

40. If you plant at 12 or 15 feet apart you will be ten years behind those at seven feet, when each are 25 years old.

41. We do not deserve well of our country if we cannot establish trees at a cost not to exceed 5 cents each.

42. The cost of planting one acre, irrespective of fencing, which will depend upon form and any advantages from local causes, will be about:—

Lifting and trenching 900 plants in October	$10 00
Opening 900 pits	17 00
Planting	8 00
	$35 00
Keeping for three years	10 00
	$45 00

43. If you purchase from public nurseries, the cost will be about *$100 more.*

44. Get your Township Council to petition Government to institute a regular system of re-planting by statutory enactments.

2.—Re-planting Uncultivated Land with Bush Trees.

Precept without example not being much, you honoured me with instructions to set the example, building upon the recommendations thus paragraphed:

On the south-west of the bush land that lies north-east of the College buildings, one acre was laid off for this experiment. It is simply bush land with its stumps and uncultivated grassy surface, never having been touched by the plough; three shade trees were left from the clearing up; the soil consists of a light clay loam with a south-western aspect, is naturally dry, and sheltered from north and east by old trees. Two of the sides were fenced, and the other two had to be erected with the best of old cedar rails, *pro tem.* Pits at 7 feet apart were dug all over, thus making 900 to the acre; size of pits 18 inches diameter, and one-third deeper than any individual tree required. Planting was overtaken from the 15th April to the 5th May.

With the exception of some European Larch, and a present of several varieties of native trees from D. Nichol, Esq., of Kingston, the trees were got from our own bush seedlings, and those of some of our neighbours within a radius of ten miles; average height of plants about four feet. Pruning of irregular branches was done on 18th May, and on 5th June rough grass was cut to mulch trees. Twice during the season we attended to the advice in number 29.

The trees were principally maple, beech, birch, black ash, black walnut, butternut, oak, elm, balsam, cedar, pine, basswood. Pine and balsam were a failure, owing to over-size and a dry season; the greater number of the hardwoods have done well, but keeping number 32 advice in view, it will suffice meantime to record the living and dead, with the whole cost of operations.

Trees alive on 31st October	715
" dead " "	185
	900

Cost:—

Clearing and preparing ground	$9 44
Digging pits	8 88
Fencing, labour only	4 75
Planting	11 50
Pruning	75
Mulching	2 25
Taking home trees	18 50
Heeling	50
	$56 57

It is plain that were the farmer not to put any value upon his own labour or that of his horses, the actual cost would not exceed $30 per acre.

3.—Tree Seeds. (Plot 30, Field C.)

This spring, we received a number of tree seeds through the Fruit Growers' Association, to be tried here.

The soil is a clay loam, and dry.

May 18. Sowed the seeds in rows, sixteen inches apart.

The following failed, or have yet failed, to germinate:—

Indian Cedar (Cedrus deodara).

Norway Maple (Acer platanoides).

Scarlet Maple (Acer rubrum).

Sugar Maple (Acer saccharinum).
Common Berberry (Berberis vulgaris).
Sasafras Laurel (Lauras sassafras).
Florida Dogwood (Cornus florida).
Virginian Snow-flower (Chionanthus virginicus).
Cockspur Thorn (Cratagus crus-galli).
American Service Tree (Pyrus americana).
American Elm (Ulmus americana).
Western Plane (Platanus occidentalis).
English Elm (Ulmus campestre).
Narrow-leaved Kalmia (Kalmia angustifolia).
Poplar-leaved Birch (Betula populifolia).
Pliant Birch (Betula luta).

The following have made a good start:—

Tulip Tree (Liriodendron tulipifera), about one-eighth of the seed has grown.
Deciduous Cypress (Taxodium distichum), one-quarter has grown.
American Beech (Fagus ferruginea), one-half has grown.
Panicled-flowering Kolreuteria (Kolreuteria paniculata), very few plants have grown.
Canada Judas Tree (Cercis canadensis), very few have come.
Honey Locust (Gleditschia triacanthos), nearly all are growing well, and at present stand two feet high.

THE SOILING OF CATTLE IN CANADA.

We are accustomed to hear of the different systems of farming called grazing, grain growing, root farming, dairy farming, and mixed farming, in each and all of which the live stock go and come from field to field in summer, according to conditions of cultivation and the various modes of management.

In these examples the animals search for food, and must be satisfied with what they find within a limited area, thus differing from those in the wild state, only in having a more choice bite for a certain time, but with less variety and fewer successions of crops, for nature, after all our combination of science and practice, gives a more regular rotation of grasses and other herbage than the best of our model farming now-a-days.

Were we, therefore, to think of the summer management of cattle on the patriarchal plan of moving from place to place, or having the range of a common bush, we possibly could not improve upon them in the desire for more palatable milk and good beef, in moderate quantity, at the least possible cost. But, comparatively new country though we be, our bounds are becoming keenly outlined, and every foot of land clearly defined. The day is not far off—in Ontario at least—when every fence will have its own place economically, when every open ditch will be grudged, every wide, private lane tightened up, every cairn of stones and swamp corner be greedily reclaimed, and every tree have its proper place on our farms.

As an agent towards such an end, the comparatively new and little understood system of cattle management called "*Soiling*" will have much to say ere long.

To show this in the most practical shape is my present duty. I desire distinctly to confine myself to the produce of certain crops used for this purpose, as against the prevailing summer management of cattle we call "*Grazing.*" It would be easy to bring in

the important story of the use of auxiliaries in both cases, but to do so would complicate and take from the value of the comparison. Soiling, then, is the housing of cattle at all seasons, and distinctively, in our circumstances, from the middle of April to the middle of October, when all their food is taken to them from the fields, in place of their being allowed to search for themselves.

First, what is our position in Ontario as cattle graziers? We cannot secure the rich old pastures of England, rich as our soils are, because we cannot secure variety enough of grasses (which means 15 to 20 kinds) to give a close bottom and offer that *succession of herbage* best for the health and growth of animal life. Our droughts, and especially our winters, are against this; we have rain enough per annum, but it is not distributed sufficiently to give the regular top-dressing so essential to continuous greenness. Here permit the remark that as we have ourselves been the cause of this irregularity of rainfall, and temperature, to a certain extent, so it is left to us to make good the balancing of the things in nature that have been displaced—how and where, the meteorologist and horticulturist will explain by-and-by, for, so sure as we are opening ourselves to the world's public markets, so sure are we bound to leave no stone unturned in view of national eminence among them.

On an average of seasons, on putting a cattle beast to the field, without any grain or cut fodder helps, there is no going back, neither is there much progress in flesh making; there is growth of bone and muscle, but comparatively little finishing on the outside or inside. So, then, we can make the frame in the field, but not complete it for the home or foreign market. In this respect, therefore, we cannot possibly compete, at present, with some other parts of the world. What applies to beef making applies to the making of milk.

With unreliable pastures for *continuous progress* in milk or beef production, the question before us is, how can we better ourselves? We have the soil, or soils; we have the indispensable sunshine, as also the irregular showers, and all the essentials towards the up-keep of fertility. Have we the enterprise, or, shall I call it, the necessary common sense? Indeed, history, past and present, shows that, with such a sunshine as ours, some nations would be in possession of an enormous agricultural wealth, by the simple economy of that sunshine in the production of repeated crops of fodder plants in one season, even from a bed of sand.

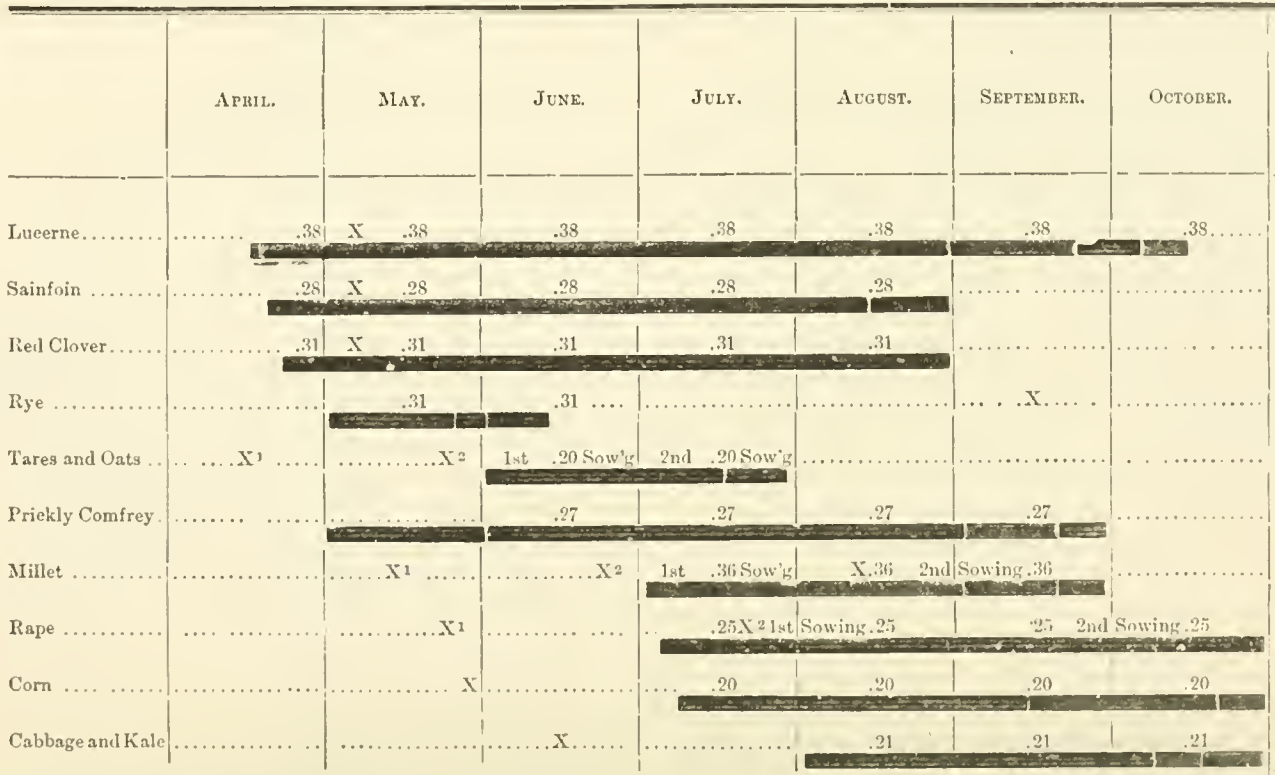
We want then to secure such a succession, or association, of green fodders during six months of the year, as shall secure the following objects:—

1. An early cut.
2. Repeated cuttings of the same plant.
3. A sufficient number to offer an unbroken supply of succulent herbage.
4. Kinds to differ considerably in their constituent elements.
5. The largest possible produce per acre, consistent with good husbandry, (and this implies much).
6. High fattening and milking properties.

I have no desire to lengthen introductory remarks, and shall now submit for your consideration, first, a diagram, showing what crops, in our present knowledge of things, can be cultivated in view of these objects. In this, we have the experience of different parts of Canada, and particularly that of the Ontario Experimental Farm.

Green Fodders for "Soiling" in Canada.

Diagram of experiments with soiling crops at the Ontario Experimental Farm, Guelph, Ontario, 1876–1880. (The X indicates the time of sowing, and the dark bars the time of cutting the fodders.)



DESCRIPTION OF DIAGRAM.

In this we have an exhibition of twelve varieties of plants from the middle of April to the end of October, in the order of earliness. Each horizontal bar represents one acre, and the time during which each plant can be cut and used on an average of seasons. The date of sowing is shown by a cross, and the number of times the same plant can be cut in one season is given in the first column after October. Following the latter information is the quantity of green fodder obtained per acre from any of the kinds all over the season, and adjoining, the weight of these in the dry or hay condition. The last column contains the value per acre of each kind, that value being regulated by the following circumstances:

Good hay from rich pasture is valued at an average of $10 per ton, and the feeding ratio or nourishing properties thereof stands at forty per cent.; taking these as standards —and they are now recognized as such—we would have this calculation, as regards, for example, lucerne:

If hay equals $10 per ton and a feeding value of .40, what is four tons of lucerne, the feeding value of which is .38? The answer is $38 per acre, and thus all over the different kinds we obtain their comparative values—the figures on the horizontal bars being the percentage of nourishing properties in each case.

The management of each crop and the characteristics of the several plants should form subjects for discussion another year.

To recapitulate, by the points sought for, we have, as regards an *early cut*, lucerne coming about the middle of April, followed by sainfoin a week later, and red clover at the end of that month, thus obtaining three tons per acre from three varieties during a time when moisture is plentiful and the temperature rarely below freezing point, the average being about 50° and the maximum 70°. This is the welcome start of the season, after the five months of dry fodders, roots, and grain.

Repeated, or rather, continuous cuttings of the same spot or plants, four from lucerne, twice from sanfoin, twice from red clover, twice from fall rye; and at least thrice from prickly comfrey; two sowings at different dates of tares and oats give other two cuttings; two also by two sowings of rape, two from two sowings of millet, and one each from corn and cabbage, so that in all we have no fewer than twenty-one cuttings from ten varieties of fodder plants.

As many kinds, therefore, as should offer an unbroken supply of succulent herbage during the whole summer months, for without tenderness, freshness and regular supply we are not in a position to impress the value of this system upon the average farmer or dairyman.

On examining the diagram, there is no time of the six months during which there are less than three sorts on hand, and in some months as many as eight; and indeed, in place of any want, the difficulty during July and August is to keep up with the succession of offerings before they become woody or matured.

It would not be difficult to add a few other fodders of less importance to this list, and especially to note a fact that on well arranged farms, where root cultivation is a prominent feature, *mangolds* are generally in such quantity, and have come through the winter so fresh and good, that they are not finished until *June*—thus, then, a very valuable help to, it may be, the scant *early* green fodders.

I cannot reccommend the practice—a very old one—now less necessary, of thinning and feeding the leaves of turnips and mangolds, during their growth, but the systematic and careful use of both bulb and leaves of those removed to make room for the permanent crop, is another thing, and a very important auxiliary to what we are treating upon.

As is well known, all animal life must have a change of food in order to secure health and the best production of flesh and milk, and so we are called upon to examine the nourishing values of these various plants as got month by month.

Rich old pasture, with its many varieties of grasses, is not only one of the most valuable fodders, green or dry, as is well known for milk making, but it also takes a high place as an actual fattener of animals; for these reasons it is used as a standard for comparing other green fooders with, and accordingly we shall adopt it on this occasion.

If then good pasture, with its 40 per cent. of nourishing properties, is a standard of nature's making as improved by man for all the essentials of animal life, it must be im-

portant to see how far our ten kinds of special green fodders come up to this standard from month to month.

Lucerne leads with .38; millet, second, with .36; red clover having .31; and sainfoin, fourth, with .28 per cent.

Three of these in April make a large start, therefore, with an average of 32 per cent., and it will be observed that all the early croppers are very much superior in their feeding values to those that come after June—millet excepted. There is then a range of no less then .18—from .20 in the case of corn, up to .38 in that of lucerne—and the fact of this difference in feeding value implies corresponding differences in the actual elements of the plants, so that we certainly have variety enough. I shall not labour this chapter with any detailed chemical analysis, as I trust it is clear that along with the variety of plants, we have also a variety of elements for all healthy and rapid production of flesh and milk—the man of science says so, and practical experience says so. Of course the mean of 29 per cent. over the season is much below the standard of 40, and this again points to the help wanted by some form of grain, should higher excellence be desirable, although many good managements consider it really unnecessary to give grain for milk where green fodders are plentiful and various.

We have now therefore established two important things :

1st. That Canada can grow the necessary variety and quantity of green fodders.

2nd. That they are well adapted to the sustenance of animal life for the purposes in view.

The next question is, what is the proper position of "*soiling*" in association with grain, root and hay cultivation, and what can be done on a farm, say of 100 acres?

There can be no idea of recommending soiling alone as a separate system of farming in this or any other country; the essentials of life cannot be neglected, nor can the average farmer run the risk of reducing his income by placing all his faith in one or two articles of production only.

There must be provision for horses in hay and grain; pasture for sheep and yearling cattle; and roots, straw, and grain for cattle, sheep and pigs in winter; and grain and potatoes for family use. By grain I mean wheat, oats, barley, and peas; and roots include mangolds, turnips, and carrots. We have to deal with the following classes of crops in our rotation.

1.—Roots.
2.—Grain.
3.—Hay.
4.—Pasture.
5.—Green Fodders.

The green fodders are divisible into—

1.—Cereals, one-half.
2.—Clovers, one-fourth.
3.—Foliage proper, one-fourth.

On soil of an average texture, the best rotation in my opinion is:—

1.—Peas and *grain fodders.*
2.—Wheat and oats.
3.—Roots and *foliage fodders.*
4.—Barley or wheat (seeded) and *clover fodders.*
5.—Hay.
6.—Hay.
7.—Pasture.

The area of each class on 100 acres would be:—

1.—Peas, 5; grain fodders, 9 ..... 14 acres.
2.—Wheat, 5; oats, 10 ..... 15 "
3.—Mangolds, 3; turnips, 6; carrots, 1; foliage fodders, 5.. 15 "
4.—Barley, 5; wheat, 3; clover fodder, 6 ..... 14 "

5.—Hay	14 acres.
6.—Hay and pasture	14 "
7.—Pasture	14 "
	100 acres.

Of the various green fodder crops there would be:—

Lucerne	3	acres producing yearly	48	tons.
Sainfoin	1	" " "	6	"
Red clover	3	" " "	21	"
Rye	2	" " "	12	"
Tares and oats	2	" " "	12	"
Prickley comfrey	1	" " "	10	"
Millet	1	" " "	3	"
Rape	2	" " "	30	"
Corn	4	" " "	80	"
Cabbage and kale	1	" " "	12	"
	20	acres giving	234	tons per ann.

The system altogether then is practically one of five divisions, having equal parts of 20 acres under roots, grain, hay, pasture and *green fodders.*

Taking a clay loam as the average texture of Canadian soils, it is obvious that a rotation of cropping agreeable to all sound theory and practice, and by which no exhaustion could possibly take place even under careless management, would be what is called the seven course, as laid down in these notes. By this our green fodders would accompany the 1st, 2nd and 4th divisions after sod-breaking, so as to agree, and not interfere with systematic rotation and management over the whole farm.

The sod from one or two years' pasture is broken up and cropped with peas and *grain fodders,* these grain fodders being corn, tares and oats, millet and rye; the second year is wheat and oats in proportion of 5 and 10 respectively; the third in roots with *foliage fodders* in the shape of rape, cabbage and kale and prickly comfrey—all the latter, as with roots proper, admitting of thorough cultivation, manuring and cleaning, upon which rests the backbone of this system. During the fourth year grass seeds (of timothy and clover) are laid down with barley or wheat, and part, if deemed necessary, with *red clover* alone as the green fodder section of this division, and of course the 5th and 6th years are hay, with the exception of, say, one-half of the 6th as *pasture*; 7th year pasture.

In all this there is an *easy and luxurious* cropping, suitable to the best of mixed farming and according with the "soiling" system under consideration. There is no excess of grain and hay, but thorough cleaning and strengthening of soils by root management, with sufficient rest (so called) by depasturing with sheep and young cattle.

The 20 acres devoted to green fodders, will on an average, give, under the best management, 234 tons per annum.

What can be done with this amount of Green Fodders.

Allowing for waste, one cattle beast of average size, age and circumstances as regards fattening, breeding, or milking, will consume daily 100 lbs. of these green materials, along with such dry fodders and grain as may be considered desirable—more or less, of course according to objects. For the six months named, this means the maintenance of 26 head, or nearly one and one-third (1⅓) animal per acre. Now, it is well-known in Canadian experience that it takes fully three acres of ordinary pasture—not poor pasture remember, but well laid down timothy and clover, to keep one of such cattle in a full progressive condition—either laying on fat decently well, or milking well over the average, no stinting or having the animals walking two miles a day over and over a twenty acre field in search of a bellyfull.

We have, then, the striking difference of four (4) to one (1) meantime, in favour of "*soiling,*" as against grazing, without allowing for any other facts, for or against. Were one-tenth of dry fodders—such as hay or straw—added to the green ones, six more ani-

mals can be maintained, but our present purpose is to follow the exact value of the soiling crops alone.

It is rare in these times to find more than 15 head of cattle beasts in all on a hundred-acre farm, summer and winter. So supposing that one-half of the soiled animals, in our example case, were for the butcher, and the other half supporters of the dairy, there would be an additional five head of yearlings and five calves, with one bull, and one score of sheep. The sheep and yearlings would be grazed, but the calves and bull housed and receiving part green fodders; these would be equal to four (4) additional average sized cattle, and so reducing the 26 to 22 head that can be maintained from 20 acres of soiling materials. Still additional to this would be what would, or should, be used for horses and pigs, so that altogether we arrive at the safe standard of 20 cattle, or one to each acre.

Soiling in Canada then is as 3 to 1, and by the system which I have thus sketched it is plain that by simply setting aside 20 acres from the 100, so as not to interfere with the reliable and profitable farming called mixed, or alternate, we can fatten, or dairy, 20 cattle in place of 7 during the six months of spring, summer and autumn.

What now is the financial position in the system?

To this, sketch first the general management that would be adopted: Upon a hundred-acre farm such as I have introduced, one man with horse and cart can easily undertake the attendance in every respect of these 10 fattening cattle, 10 cows, 5 yearlings, 5 calves, 1 bull and 20 sheep. Any of the yearlings intended for breeding would be grazed during their second summer, but those for fattening should be systematically housed—getting one hour's exercise daily; the calves would also be under cover, the sheep on pasture of course. At the most then, the cattle man would have 30 head to be soiled. After feeding and cleaning up in the morning he has to cut and cart home 2,500 lbs. of green fodder, in two loads, for the evening use, and as all green fodders are better to be slightly "wilted," not heated, ere offered, he would thus have to secure another cut in the evening to be used for next morning's meal.

Financial Result of Six Months "Soiling" from Twenty Acres.

10 Fattening cattle: 108 tons green fodders at $2.15. (See diagram)		$232
Proportion of attendance		50
		$282
10 milk cows: 86 tons	$184	
Proportion of attendance	40	
Milking	20	$244
Total debit		$526
Increase on 10 fattening cattle $5 per head per month	$300	
Manure (bedding inclusive) 60 tons	50	
	$350	
Milk from 15 cows; 180 days, 10 quarts at 1¼cts	$225	
Manure 50 tons	40	
	$265	
40 tons green fodder supplied to other cattle	86	
Total credit		$701
Balance to credit		$175

Twenty acres under ordinary good pasture and seasons, will graze seven head of cattle :

Rent or value of 20 acres at $3		$60
Proportion of management		7
		$67
3½ fattening cattle for five months	$50	
3½ milk cows, 150 days, at 8 quarts	60	
Estimate value of manure left	10	
		— $120
Credit balance		$53

In the case of "soiling," a clear profit of $175—and in that of grazing $53—the one equal to nearly *three rents* per acre, the other hardly one rent.

I am handling a strict debit and credit account, and not speaking of so much flesh or milk revenue per acre, without charging, what very few farmers do charge, in estimating profits. All this, remember, without any help from bush or stubble pasture, and any roadside pickings—no meal, bran, or slops of any sort, but the plain produce of the soil in each case.

Again, then, let us note that "soiling" in Canada means fully three times the profits of grazing, in addition to other considerations now to be examined.

Some of the Advantages and Disadvantages of Soiling.

1. Where land is a consideration, there is a great saving of it by being enabled to maintain at least one cattle beast per acre, in place of having to calculate on allowing three acres to graze one.

2. Were we to reckon by the amount of fodder produce (soiling, or pasturing), there a large saving of food in avoiding destruction by cattle traffic.

Where we have apparently useless quantities of any kind of straw, chaff, and hay—good or poor in quality—they can be safely used in association with the moist green fodders.

4. We obtain fully double the quantity, and proportionately much more value, of manure by soiling than by allowing it to have its own way in the field, the roadside, and the court. I am of opinion, that were we able correctly to estimate the value of farm-yard manure in connection with this matter of soiling of cattle, there would be no concern on the part of the farmer as to any other form of profit. He would simply be so independent as to be able to throw all beef and milk into the bargain, or allow them to stand as the mere overflowings of a system that puts him in possession of all the past and future wealth of his fields. Would the day were here when we all knew how to *make*, how to *preserve*, and how to *apply* our cattle droppings.

5. The larger produce of flesh and milk on an average.

6. Gives greater variety of materials, allows uniformity in management, which gives greater comfort and health, and less liability to accidents.

7. But it requires greater care and intelligence to establish and maintain such a variety of crops; so, if this is to be put up as an objection to the system, we had better say beat at once. When any farmer begins to speak about "troubles," and first expense, and too much looking after of things, then the sooner he falls into the ditch the better. Let him continue his successive crops of wheat, and give his cattle the range of all the farm, so as the earlier to convince him of the high life he is leading—an extravagant, selfish life, as well as a dangerous one.

8. It is well known in soiling experience that cows give a greater flush of milk from good early pasture than from having the food taken home to them The change from winter confinement to the rich and plentiful crop of grass, along with the easy conditions under which they obtain it, does this. Were this grass rush to continue, there would certainly be much less in favour of housing; but it does rarely keep up, and, while there is not so much milk in April, May, and part of June, there is a continuous flow, with no falling off, through July, August and September.

Requisites in Cropping of Green Fodders.

1—*Soils:* Depth, dry, *rich sub-soil.*

2—*Seed:* Lucerne, 20 lbs.; Sainfoin, 3 bushels; Red Clover, 20 lbs.; Rye, 2 bushels; Tares and Oats, 2 bushels and 1 bushel; Millet, 1 bushel; Corn, 3 bushels; Rape, 8 lbs.

3—*Cultivation:* Broadcast, drilling, horse-hoeing.

4—*Manuring:* Liquid, Special, Farm yard Manure.

Essentials: A rich soil, moisture, and heat.

THE PRACTICAL APPLICATION OF SCIENTIFIC KNOWLEDGE TO THE FEEDING AND FATTENING OF LIVE STOCK.

We tried to throw some light upon this subject in last year's report. It is surely time the ordinary farmer were shown a few steps in such a valuable ladder. I mean the *actual use* in practice of what the chemist says, and what experience says, is the feeding property of each of our animal foods. He has hay, straw, grain, and some special preparations, which he is told are good for certain purposes, but is not given any reasons for their particular use. In place of being only the agent in their transfer, he should also be the *regulator* according to the requirements of each class of animals, whether for (1) ordinary growth in youth, (2) rapid growth in youth, (3) production of milk, (4) production of beef or mutton under various conditions, (5) working animals, and (6) breeding animals.

In applying what we know of this subject to our own case at The Ontario Experimental Farm, I beg to submit first of all, the list of classes of animals in the order in which, in my opinion—opinions differ no doubt—they should be fattened or fed, beginning with those requiring most flesh and fat forming materials, and gradually ranging into those that should receive the least.

Order of Requirement of Fattening Properties in Food for Various Classes of Live Stock, at the Ontario Experimental Farm, during Winter, 1880-81.

1.—Fattening old oxen, most fat required.
2.—Three-year-old fattening steers.
3.—Two-year-old " "
4.—Fattening wethers.
5.—Driving horses.
6.—Farm horses (winter).
7.—Bulls.
8.—Rams.
9.—Breeding cows.
10.—Yearling steers.
11.—Heifers.
12.—Ewes.
13.—Dairy Cows.
14.—Lambs.
15.—Calves, least fat required.

Second.—We must be in possession of the

Order of Fattening Properties in Food to be used this Winter.

1.—Oil-cake	contains	82	per	cent	of	fat	and flesh materials.
2.—Barley	"	80	"	"	"	"	"
3.—Corn	"	79	"	"	"	"	"
4.—Oats	"	75	"	"	"	"	"
5.—Pease	"	73	"	"	"	"	"
6.—Bran	"	64	"	"	"	"	"
7.—Hay	"	59	"	"	"	"	"
8.—Pea straw	"	11	"	"	"	"	"

9.—Oat straw contains 41 per cent of fat and flesh materials.
10.—Corn fodder " 37 " " " " "
11.—Wheat straw " 33 " " " " "
12.—Roots (mean) " 9 " " " " "

Cattle Fodder.
1 of hay —59.
1 of oats —41.
1 of corn —37.
1 of wheat—33.
Mean 42½

Sheep Fodder.
Half hay —59.
" pease—41.
Mean 50

From these we can now make a

Tabular List or Guide to the Feeding and Fattening of our Live Stock during Winter, 1879-80.

No animal to get more than 15 lbs. fodder or hay, 12 lbs. of meal, 90 of roots, 3 of oil-cake, 5 of oats, 2 of pease, or 3 lbs. of bran.

CLASS OF ANIMAL.	Food and Daily Allowance Per Head in lbs.										Parts of flesh and fat formers per head per day.	Percentage of flesh and fat to other parts of food	Total quantity per head per day.
	Cattle Fodder.	Sheep Fodder.	Hay.	Bran.	Roots.	Oats.	Corn meal.	Barley meal.	Pea meal.	Oil-cake.			
Horses—													
Farm			12	½	1	5					11.56	60	18½
Buggy			10	¼	1	7½					11.93	65	18¾
Cattle—													
Oxen Fattening	15			2	90		12			3	27.69	23	122
Steers, 3 years "	12			2	60		10			2	21.32	22	86
Steers, 2 years "	10			2	50		8			2	17.94	25	72
Steers, 1 year	8			2	40				2		9.10	17	52
Bulls	9			2	50			2			11.23	18	63
Breeding Cows	9			2	50			1			10.10	17	62
Dairy Cows	8			2	40			½			8.48	16	50½
Heifers	8			2	40			1			9.08	17	51
Calves	6			1	20			½			5.19	19	27½
Sheep—													
Wethers Fattening	5			1	8				1	½	5.00	32½	15½
Rams	5			½	6				1		4.09	32	12½
Ewes	5			½	5				1		4.00	35	11½
Lambs	3			¼	3				½		2.11	33	6½

Consecutive Order of Animals in Feeding, with Total Values or Feeding Ratio for Each.

	Feeding Ratio.	Per cent. of fat.
1.—Fattening Oxen	27.69	23
2.— " three year old Steers	21.32	22
3.— " two " "	17.94	25
4.—Driving Horses	11.93	65
5.—Farm Horses (winter)	11.56	60
6.—Bulls	11.23	18
7.—Breeding Cows	10.40	17½
8.—Yearling Steers	9.10	17¼
9.—Heifers	9.08	17
10.—Dairy Cows	8.48	16
11.—Calves	5.19	19
12.—Fattening Wethers	5.00	32¼
13.—Rams	4.09	32
14.—Ewes	4.00	35
15.—Lambs	2.11	33

Example of method of calculation :—

Breeding cows, 9 lbs.	fodder	@ 42 cts.	=	3.82	of flesh and fat.
2 "	bran	@ 64 "	=	1.28	" "
50 "	roots	@ 9 "	=	4.50	" "
1 "	barley meal	@ 80 "	=	.80	" "
				10.40	

Now, 10.40 to the total quantity of 62 lbs. consumed is equal to 17½ per cent. of fattening properties. Thus, then, we say the farmer can easily make up for himself a yearly guide to the winter management of his live stock, with particular regard to the making of bone, muscle, blood, milk, flesh and fat. If he has old working oxen to be fattened off, the mean of the fodder, and of bran, roots, corn and oil-cake may safely reach as high as 27.69 per cent. in fattening materials, according to quantity consumed, and having due regard to the more cautious up-bringing of calf life, the ratio of fat to other materials in the kind and quantity of food to be given, should range about 5.19 per cent. Between these probable extremes, we have, in our own case this winter, as thus illustrated, *nine* others, all distinct in themselves by reason of class, age, and purpose. The sheep, in four classes, are similarly treated.

HAND-BOOK TO CANADIAN CEREALS.

In pursuance of the resolution and plan proposed and begun in my Annual Report for 1879, under this heading, I take pleasure in sketching the character of some sixty varieties of *Bald Winter Wheat* that have been cultivated by us during the past five years. It will be difficult to avoid repetition of terms, so the more nice readers will have to give way meantime to those who look mostly for practical information.

Large value in small space should be our first idea of a typical wheat plant of any variety; to secure this the head, or ear, should be compact, having the most possible number of berries in the length and breadth, and covered or protected by the minimum quantity in thickness and length of chaff, or awn. Berries can be too close on the head in certain climates, and may be too heavily overlaid with covering so as to hinder ripening and confine their individual bulk. The form of head best calculated to carry the largest number of berries with sufficient air room for proper maturing is that which, in whatever way it is presented to the eye, will appear of almost equal breadth, whether by the side or by the face, the face being somewhat broader than the side; the florets should alternate and overlap each other to about one-third of their height, should stand out from the stalk at an angle of forty-five degrees, and never have less than two berries in each bunch or floret, some having as many as three or four. A thick-set head has five sets of florets to the inch, a thin one two.

In judging the grain of wheat, the points are so important that it will be best to number and describe separately:

1.—The first thing that strikes the eye is colour. Formerly wheat was classified by *white* and *red*, but now when we speak of colour as a point of merit in any variety it means that sort of transparency or brightness which reflects light, as opposed to dulness, or having a bleached appearance. This should be uniform and not parti-coloured.

2.—*Size*, or evenness of sample, refers to uniformity of berries to each other, not some large and others small, but nearly all alike—whether large, medium, or small-sized.

3.—*Structure* characterizes the gritty, hard, or flinty kinds from those that are soft and meally.

4.—The *Skin* may be thick or thin, rough or fine, and should always be smooth, unless when curly from its natural fineness.

5.—The *Form*, or outline, of the berries should be alike, whether long, short, or round.

6.—The *Bosom* may be full and close, that is, with a well sprung rib, or an open and flat one.

7.—*Plumpness* has no reference necessarily to one uniform outline like a bag of flour, but that the berry is well filled-out, of whatever form, showing no slackness of skin from want of food—not shrivelled.

8.—*Smell* should not be musty or sour.

9.—The *Taste* should be nutty, sweet, and mellow, not sour or bitter.

10.—The *Germinating* points should be distinct; the base, or root end prominent, and the blade end slightly hairy.

Miscellaneous qualities:

11.—Hardy, productive, and a good miller.

12.—Weighing, after cleaning, not under sixty pounds per bushel.

13.—Comparative freedom from diseases—whether animal or vegetable.

14.—To tiller, or stool, well—that is, to produce five or more perfect plants from one seed, under good management.

15.—To have sufficient strength of straw to carry the head.

16.—The straw to be of good quality as regards freedom from pith.

Bald Winter Varieties of Wheat.

Arnold's Hybrid (Philadelphia).—Head strong and thick, with well-set florets; straw also strong, and of good quality. The grain sample obtained was not first-class, being small, moderately filled, and of a dark colour; crop of 1878 became inferior—smaller, darker, and shrivelled; that of 1879 was much improved, or about equal to the original, with longer berries, and produced thirty bushels per acre. The crop of 1880 was inferior to 1879,—grain not being so evenly filled.

Arnold's Hybrid (Washington).—Head short and moderately thick, with good straw. The sample got was large, plump, of a dark red, and parti-coloured. The crop of 1878 was much inferior, smaller, shrivelled, and darker in colour, while that of 1879 was good, though not so well filled as the original; 1880 gave somewhat better than 1878.

Arnold's Victor (Paris, Ont.).—This hybrid has head and straw resembling Gold Medal. The crop of 1877 was good in colour, nice and plump, though a little irregular in size

and form; 1878 was poor in every respect, but 1879 gave a much improved sample, unequal, however, to that of 1877. Produce in 1879—39⅔ bushels per acre, weighing sixty pounds per bushel. The plants of 1879-80 were entirely winter-killed.

Bull Forward.—A very fine sample from the Centennial Exhibition of 1876. The produce in 1878 was much inferior, delicate-looking, small berries, well coloured. That of 1879 was larger, but irregular, becoming darker in colour, and the crops of 1880 is not so deficient as many others. The head is too narrow, being, however, long and fairly set.

Blue Stem.—This is not unknown in Ontario. What we got of it in 1877 was a good dark colour, irregular in sample, and all of a small size. The cropping of 1878 was much inferior, but improved in 1879, though not equal to original—producing 40 bushels that year.

Bush's Prolific is an American variety of medium size, and somewhat dark coloured. The crop of 1878 was practically a failure—shrunken, miserable-looking stuff. 1879 gave a large improvement, and 34 bushels per acre, lighter in sample, not so well filled, more irregular; and 1880, though not equal to 1879, kept up well, considering. The head is poor—tight, narrow and short.

Bush's Satin Chaff, also from the States, was originally of fair size and plumpness, but parti-coloured and of a dark red tinge. In 1878 we had a much smaller and poorer sample, with some improvement in 1879—holding its colour, but shrunken, and 1880 brought about its failure for the present. The head is of fair length, but too open; straw strong; chaff slightly velvety.

Bush's Large White.—Of good colour, but small and shrivelled in 1878, and up to date is a failure, being too tender. Straw good; head too open, but otherwise good.

Bush's Mammoth.—The sample from the Centennial looked mixed, was large, plump, and of average colour. Our produce of 1878 was very inferior—dark and shrunken. There was a decided improvement in 1879 over 1878, the darker colour increasing, however; 1880 was a failure. The head of this is very long, yet fairly clad, the chaff being a white velvet; straw was much subject to rust.

Cook's White.—Grain of medium size, nicely coloured, regular and plump. 1878 gave a darker and smaller grain, but altogether not so bad, considering the season. 1879 was very good, of fair size, well filled, but darker than the original. It was winter-killed during 1879-80. Head short and thick, with strong red chaff and good straw.

Clawson Club.—A very good sample of the ordinary Clawson, or Seneca, under a slightly new name, the berry being slightly smaller. The crop of 1878 wanted a little better filling to make it a good one. 1879 was not equal to the original, but good in size of grain; it was shrivelled and unfed in 1880. The ear is a Clawson one in size, colour and form.

Canada Winter No. 1.—The growth of 1878 and up to 1880 inclusive was practically nothing—even that of favourable 1879 being medium; head narrow and tight.

Canada Winter No. 2.—The original grain of this was a little irregular, but otherwise good; colour dark; 1879 gave the only fair sample—the head being an average specimen.

Canada White.—Original sample large, regular, very plump and fine in colour; 1878 gave a very poor, shrivelled, small, dark-coloured grain; 1879 was much improved, indeed, almost up to first sample in size and form, though darker in colour and not quite so plump, yet well filled, and giving 25½ bushels per acre; 1880 was not so good; the straw is strong and clean; the head a little short, square, however, and thick set.

Clawson (or Seneca).—I think it may be safely assumed that the millers' account of this wheat is now over the jealous stage and into the fastenings of their purse. The fact of non-controversy is evidence of this. Our 1876 experience was not first-class—berries irregular, somewhat parti-coloured, small sized, and not well-filled. Those of 1877 were much improved, larger, better coloured, but not a very bright sample; 1878 was much inferior—fairly coloured, however. One-third of the berries very small, badly filled, and shrunken. The head was much too open and thin, yet with plenty of straw. The crop of 1879 gave a very fine head in size, compactness—long, strong and close; 41⅔ bushels per acre, weighing 61½ lbs. per bushel. We cannot speak of any success during 1880.

Diehl.—It must be remembered that for some of our best Canadian fall wheats, our position with its large exposure and high elevation is not the best adapted to their thorough growth and maturing; for example, we cannot show a sample of the Diehl or Soule equal in plumpness and colour to the Galt and Hamilton districts by reason of these climatic peculiarities, not by reason of unsuitable soil. Here we find the Diehl with a medium-sized head, close set, dark and strong however, the grain not taking on the right colour or size all over, many of the berries being small.

Diehl Fife.—Is but the old Diehl under a new name apparently, with which we have made no progress, except in growing a good balanced head all over.

Excelsior.—The original sample of this had a nice bright colour, flat bosom, and the berries over the medium size. Though we obtained forty-seven bushels per acre in 1879, the grain was not equal to the start, yet fair, and 1880 even gave a good sample, wanting filling; a long fairly balanced head.

France.—The original of this resembled a medium sample of Soule. While the produce of 1878 was "nothing," that of 1879 maintained its old points in most respects, and even better in colour; the head is chubby.

Fultz (Kansas).—The grain of this cannot be called plump, the berries are pointed, parti-coloured, and a fair medium sample all over; the head is narrow, pointed, and somewhat open; 1879 sample was superior to that of 1880, yet the colour improved through the latter year.

Fluke (Illinois).—This has all along been the earliest maturing wheat in our extensive experience; the head is small, of medium closeness; the grain has improved in colour but not in form or size.

Gold Medal.—Our five years experience of this hybrid has been very satisfactory. In 1876 the grain was comparatively poor, being irregular, badly filled, but good in colour, that of 1877 was very good all over except colour; 1878 though not down to 1876 was little superior; 1879 gave us a better fed berry, with a darker colour, and a yield of 36 bushels per acre. Winter 1879-80 proved too much for this, as it did for most other *hybrids*; the head is short, thick, and strong.

Kentucky.—A good bright coloured wheat of fair size, which in 1878 kept up in size, did not mature sufficiently, giving straw at the expense of grain. 1879 improved upon the original, and even in 1880 with its blight and rust, the size was maintained but not filled correspondingly. The head is longish, a little open, but otherwise good.

Lennie's White.—Direct from England, and one of the best of its flour makers, does not withstand our winter, though hardier than the Essex Red under like conditions.

Mexican.—From the American Centennial of 1876, had a dark grain unevenly coloured, of medium size, but fairly filled. The colour inproved in 1878, but otherwise the sample was altogether inferior; 1879 brought a delicate whiteness, berries being somewhat narrower and not so even in sample; again, 1880 made a darker shade, not well filled, but yet even in its irregularity. It is a good tiller, straw rather weak, close head, shortish (resembling Gold Medal), and takes a medium place in hardiness.

May Red.—Long berries, pointed, and from 1879 made as good as that from the Centennial. Head too open, narrow, and having a delicate caste, not characteristic enough.

Mediterranean.—The original was poor, dark and unequal; 1878 did not improve the sample, except in colour; the colour continued to improve in 1879, and the whole sample was much superior, even as against the original. Head compact, a fair size, with a tendency to over closeness.

Nursery.—Characterized by a round, tight head, a form of head most objectionable in any case, and otherwise a plant of little importance apparently.

Rust Proof.—A good average wheat, not rust-proof however; 1879 gave 25½ bushels per acre; better colour than Centennial sample, and equal in evenness of grain. Head about medium in size, and well up in points.

Reid's Giant Red Chaff (hybrid).—A pointed berry, not large and not plump. While very poor all over in appearance from 1880, it gave 21½ bushels per acre. The head and straw resembles the Clawson.

Red Velvet.—An oval shaped berry of a good dark colour. Head narrow, tight and hide-bound in appearance.

Red Winter.—Not unlike the Scott, and in our best season of 1879, gave a good sample, hardly plump enough, which did not deteriorate so much in 1880 as others. The head is rather short, but nice and compact, though somewhat pointed.

Reid's Golden Kernel (hybrid).—A medium coloured, open bosomed wheat, having a slight resemblance to Clawson, that gave us 25½ bushels in 1879.

Russia.—A hardy variety of a darkish colour that has not improved with us. The head is long and open, and inclined to beard.

Russia Nos. 2, 6 and 9.—In some respects resembling the Russia, as above, with thicker chaff and better at tillering; all hardy, and particularly too long and open in the head, thus reducing their cropping qualities.

Scott (Glasgow ?).—A dark, even sampled grain, with short, compact head, having a tendency to beard.

Silver Chaff.—This once famous wheat has almost refused to do anything here. In 1876, the sample was fair, though irregular, not well enough filled, nor perfect in colour. In 1877, berries were large, well filled, of a nice bright colour, and that gave the very large yield, for that year, of 57½ bushels per acre; 1878, fell off, poor in colour, shrivelled and uneven. In 1879, we had 30 bushels per acre (57 lbs. per bushel), but in most essentials a very poor sample. The straw has been good; heads, long, strong and well set.

Soule.—As elsewhere remarked, we cannot grow a first-class sample of this very fine old Canadian winter wheat. The quantity has averaged 32 bushels per acre, and the weight 61 lbs. per bushel; but colour has not been satisfactory, berries are too tight and irregular, as if unequally matured. Head has been good in form and size, with average straw.

Tasmania.—The original was a good sample in most respects, but our experience has proved it to be too tender.

Treadwell (bald).—Grain seems to be mixed; a bald head, not close nor yet open; somewhat resembling Soule, with a tendency to beard; colour good; berries well filled.

Turcana.—Has a long, open head, with a large, plump, dull-coloured berry. Tender, and has largely deteriorated in sample.

White Velvet.—Has a head with velvety chaff, of fair length, strong and compact. Good straw; subject to rust Sample has not improved with us as yet, being also tender.

Washington—Nos. 1 to 17.—These, out of many others similarly distinguished, have done best with us during the last four years. The average produce has been 34½ bushels per acre, with a distinct want of feeding over all the berries, which are generally large and lanky. Heads are also generally of the small open class with a tendency to fineness or want of boldness. The largest cropper was No. 13, the smallest, No. 17.

Thus, as yet, we have made no great discovery in any new winter wheat suitable to Ontario, nor, I presume, can we hope to do so, without more trials, more failures, more perseverance, more extensive gatherings, more systematic inquiry and collection, and more attention in every possible respect. This is a great field in truth, and one deserving the whole attention of one man, specially authorized and provisioned—an enthusiast of no mean parts, appointed by Government—keen to catch, safe at handling and experimenting, and reliable in reporting. While the Ontario Experimental Farm has not re-clothed the Province with another spring wheat equal to the grand old *Fife*, or the equally valuable winter Soule and Diehl, it has already given an interest to the subject, and a prominence to some varieties that, some men tell us, goes a long way to meet the necessarily heavy draft on the Legislative purse in its up-keep. We have it from not a few quarters, that what we have done in the establishment and scattering of the *White Russian* spring wheat throughout the Province, marks the fact of a valuable chapter in our history. If we do not know how to labour and wait, we need expect little success.

OUR 1880-1 CATTLE FEEDING EXPERIMENT.

Many of our breeders and fatteners of live stock, are in the practice of giving old fodder and roots unprepared, that is the hay and straw are not cut, nor are the roots cut or pulped. As many others are believers in everything being cut and pulped, and given separately, or in the shape of a pudding. The advocates of either plan cannot of course

speak of definite comparative results under exactly similar conditions, and so we have thought it desirable to conduct an experiment this winter, having in view the elucidation of such a very valuable point.

We have been fortunate in securing, four two-year old Shorthorn grade steers, of precisely similar breeding, almost exact in age, that were bred and have been under the same management all along.

Along with these, as additional data for evidence, we have set aside four yearling cross-bred steers of our own, two of which, with two of the others, will be kept upon whole fodder and roots up to May next, and the four others will be treated to the same kinds of food, prepared by cutting and pulping. During the same period all will receive corn meal and bran. Everything will be weighed as dealt out, animals weighed weekly, and all attendant circumstances carefully noted. The handling of this experiment will be conducted by Mr. John Leask, one of our leading second year students, and it is my duty to record here that every second year student is taking a keen interest, and has all along advised with me in the object, the purchasing, and the regulation of this experiment.

THE PRESENT IMPORTANCE OF DIFFERENT GRADES OF WOOL.

We cannot too often impress our farmers with the difference in value between various samples of the like article as produced by themselves, whether it be beef, mutton, wool, grain or any other crop; indeed, while the Government looks to the more active of us to be stirring up such matters, there yet rests the duty upon all Legislators of pointing forward when any branch of their economy is making true indications.

As one of these, not yet sufficiently clear among us all, and that is, however, making loud calls upon our enterprise, note some facts with reference to different grades of wool in this Province.

The British Colonies pay more attention to the quality of wool than she does herself, and up to a recent date, this aim was correct, but now, in addition to quantity, the world wants quality and a certain grade suitable for certain purposes. The market of three years ago, and many years previous, was weight of fleece along with weight of mutton, with out particular regard to sample in either article, but that market has changed; the world now wants quality, as represented mainly by fineness and medium length, along with the quantity. In addition to this change in wool, there is also a very decided preference for another class of mutton; hitherto the most of us were asked to grow size of carcass without regard to quality as indicated by fineess of grain and proper admixture of fat and lean, but now we are told to produce an average weight having the quality referred to.

Weight of carcass and weight of fleece have been, and are still, obtained from Lincolns, Cotswolds and Leicesters, or by their crosses. These give the heaviest mutton, and the longest and heaviest wool, so that while at present there are many special fields for these breeds, both for flesh and wool, the great market for the million is bidding them good-bye, for a time at least.

On the other hand, the average weight of carcass and fleece, with quality as now required by the great market of the world, are obtained from any of the Down breeds of sheep—Southdown, Shropshire Down, Hampshire Down, and Oxford Down, or by their crosses.

The question is not one only of supplying two classes of goods most in demand: It is most clearly one of larger returns under any circumstances; take, for example, the case of two shearling wethers ready for market (and by the way all our mutton should be finished at this age), one the ordinary grade of the country, what may be called a Canadian wether, possessing part Leicester, Lincoln and Cotswold blood, and the other the first cross of any of the pure-bred Downs named, upon such a Canadian ewe.

Difference in value between a common Canadian, and a Down-Cross, Shearling Wether.

	Canadian.	Down Cross
	$ cts.	$ cts.
Canadian Wool, 4½ lbs. at 30c.	1 35	.....
Down Cross Wool, 7 lbs. at 35c.	.....	2 45
Canadian Mutton, 145 lbs. at 4c.	5 60	.....
Down Cross Mutton, 170 lbs. at 5½c.	.....	9 35
	6 85	11 80
Difference in favour of Down Cross	4 95	.....

This remarkable difference should come home very forcibly to us all; we take it to ourselves at this farm, though, of course, being obliged to maintain a variety of breeds for educational purposes, we cannot change as the ordinary farmer may, but, supposing we could, and taking our 1880 clip for illustration, there is the following striking evidence:

1880 Clip of Wool at The Ontario Experimental Farm.

Long Wool—95 fleeces, 8 lbs. each, 760 lbs. at 30c.	$228 00
Medium Wool—(Oxford Down, and Oxford and Southdown cross upon Canadian ewes) 22 fleeces, 7 lbs., 154, at 35c	53 90
Short Wool—21 fleeces, 5 lbs., 105 lbs. at 40c.	42 00
In all, 138 fleeces, weighing 1,019 lbs. (7⅜ each).	$323 90

If the 95 fleeces of long wool had been from common Canadian sheep in place of heavy pure-bred Cotswolds and Leicesters, the average weight would not have exceeded 4½ lbs. each, which would have fetched $128.10, and had the 95 sheep been improved by Down-crossing, the wool would have weighed 665 lbs. and brought $232.75, or a difference in *wool alone* of $1.10 per head per annum. But, further, had these been a flock of 95 shearling wethers shorn in May and shortly afterwards sold for shipment to England, the accounts would stand thus:—

	Canadian.	Down Cross.
	$ cts.	$ cts.
427 lbs. Wool	128 10	.....
665 lbs. Wool	.....	232 75
13,775 lbs. Mutton, live weight	551 00	.....
16,150 lbs. Mutton, live weight	.....	888 25
	679 10	1121 00
Difference	441 90	.....

If this is not proof enough to convince and convert, then we needs must despair in all truth. The cost of keep is alike for both classes, and all that would have to be extra debited to the improved wool and mutton is interest on the extra value of a pure-bred Down ram.

Nationally, this subject is all important. Canada should easily raise and dispose of 20,000 head of shearling wethers annually ; the *difference* in favour of the improved animal would give $22,000 for wool and $75,000 for Mutton, or $97,000 of a gain to the country.

X.—ESTIMATES AND RECOMMENDATIONS FOR 1880-81.

First—We require the new live stock as detailed in the introduction herewith.

Second—The extra team of horses for instruction and fallowing, as explained under the heading " Farm Instruction."

Third—Drainage has been neglected for two years, and must be continued, and should be completed during next two years.

Fourth—So also in fencing, we have done nothing for some time, by reason of large expenditure upon the College buildings, and now it must be overtaken.

Fifth—As yet we have no cover for our implements and machinery.

Sixth—A small sum is required for new implements.

Seventh—Cottages for the Farm Foreman and Gardener are already on the card from last year's estimates.

Eighth—We shall be glad to continue the tree-planting experiments so well begun, in addition to those in the hands of the Fruit Growers' Association.

Ninth—We have not completed the number of tools for instruction purposes in the Mechanical Department.

These may be estimated thus:—

Live Stock	$15,200
Instruction Horses	300
Drainage	1,000
Fencing	1,000
Implement Shed	500
Implements and Tools	1,500
Tree Planting	100
Experimental Preparations as usual	900
	$20,500

The Ontario Agricultural and Experimental Union.

It affords me much pleasure to draw your attention to the Society under this title, as recently formed by our own students. It comes more immediately under my report than that of the President, because of practical farming being its largest field, and of my position as President thereof for the current year. The accompanying note of Mr. C. S. Dickinson, Editor, saves explanation by me, and, in addition, the constitution as copied herewith will explain fully. We had a very hearty and profitable meeting of officers, students and ex-students at last Easter, when, of course, much was initiatory ; and now, being thoroughly organized, we trust, ere long, to make our union a felt power throughout the Dominion.

To the Honourable the Commissioner of Agriculture :

Sir,—Since the above-mentioned Union has been formed in connection with this College, we deem it but due to the position you hold to inform you as to its origin and the aims of its promoters.

Some three years ago it occurred to a Mr. Toole—one of the most successful of our students—that it would enhance the value of our education, and tend to our mutual improvement if, in connection with this College, some sort of a union were established wherein matters pertaining to agriculture might be discussed and the results of our experience interchanged.

In pursuance of this idea a meeting was convened, and some twenty or thirty members were enrolled. The matter was then allowed to fall into abeyance until a further accession of members should justify us in drafting a constitution and electing the necessary officers.

Last Easter the subject was again brought to the fore, ex-students were notified, and meetings were held on two successive days within the College buildings. Some very valuable information was given by the old students present, and letters were received from others who were unable to attend; officers were elected, and a committee was appointed to draft the appended constitution.

We have now on our roll some 120 acting members, who form the nucleus of what may be, we hope, one of the most successful Agricultural Societies in the Dominion.

In conclusion, I would remark that the College authorities are unanimous in their support of the Union, not only on account of its intrinsic merit, but also because they view it as a means of keeping sight of the students after they leave the College, and of proving to the country at large that this institution turns out not nincompoops but successful farmers and intelligent men.

Hoping that you will see fit to accept the accompanying invitation to join us as an Honorary Member,

I am, Sir, on behalf of the Union,

Your obedient servant,

C. S. Dickinson, *Editor.*

(*Second Year Student.*)

Constitution of the Ontario Agricultural and Experimental Union.

Objects of the Union.

The objects of the Association are to form a bond of union among the officers and students, past and present, of the Ontario Agricultural College and Experimental Farm, to promote their intercourse with the view to mutual information, to discuss subjects bearing upon the wide field of agriculture, with its allied sciences and arts, to hear papers and addresses delivered by competent parties, and to meet at least once annually for these purposes.

Admission of Members.

All officers and students, of whatever time, shall be entitled to become members of the Union on paying their subscription.

The Hon. the Commissioner of Agriculture for the Province of Ontario, for the time being, shall be an honorary member of the Union.

Subscriptions and Privileges.

Members shall pay the sum of 50 cents annually. They are eligible to all the offices of the Union, and shall receive gratuitously any reports of the same which may be published after the date of such payment. For any reports previous to their admission, they shall have to pay the sum of 25 cents.

Every ex-officer and ex-student who is in regular accord with the Union shall be considered as a Corresponding Member thereof. Each shall be entitled to the privilege of receiving, for experimental purposes, at least five samples annually of such agricultural seeds as may be on hand for distribution at the Ontario Experimental Farm. He shall report to the Union the results of such experiments, and also give his experience on such subjects as come within the scope of the Association. Ex-officers and students, who are members, shall be entitled to receive, by correspondence, if necessary, such information on the work of the Union, or that of the Ontario Agricultural College and Experimental Farm, as may be deemed reasonable by the Executive Council.

Meetings.

The Union shall meet annually at the Ontario Agricultural College, for one day or more, beginning two days previous to the Easter closing exercises of the Institution.

Officers and their Duties.

The officers of the Union shall consist of a President, Vice-President, Recording Secretary, Corresponding Secretary, Treasurer, and Editor of Transactions, who shall be appointed annually by the general meeting, and hold office for the ensuing twelve months.

The President, as chief officer of the Union, shall be *ex officio* a member of all committees or councils thereof during his term of office.

The Vice-President shall have powers similar to the President, but only in his absence.

The Recording Secretary shall keep the minutes of the general meetings of the Union.

The Corresponding Secretary shall conduct all business in connection with the Union in regard to membership, general meetings, and all the business of the Executive Council, for which purposes he shall be *ex officio* a member of that Council.

The Treasurer shall collect all fees, and keep account of all receipts and disbursements of the Union as may be authorized by the general meeting and Executive Council.

The Editor shall receive, revise, and attend to the publication of such addresses, articles, or papers as may be authorized for publication in the transactions of the Union.

Executive Council.

The Executive Council shall consist of the officers of the Union for the time being. Its duties shall be to prepare a programme for annual general meetings, invite and arrange with parties for the reading of papers, to appoint reception and sectional committees, and such other work as has been indicated for it in this Constitution, or which may be authorized by the general meetings.

Accounts.

The accounts of the Union shall be audited annually by the Auditors appointed by the general meeting.

Alteration of Constitution.

No part of the Constitution to be altered except at an annual general meeting of the Union, and then only by giving at least three hours' notice of such intended alteration.

XI.—CONCLUDING REMARKS.

Is the education of the farmer in his own profession still a problem? May it be said that his case has been, and still is, largely one of compulsion—that the bettering of his condition has been forced upon him by outsiders; that he has been petted and even dragged to the doors of his own school?

This question is of general application—European and American. The Britisher has long had a dream of more produce and greater profits by chemical knowledge disseminated through schools and experiments, and he is still a deep scientist. The guano fever of twenty years ago helped to carry him into the present insolvent gutter, and it seems to me to be as clear as noon-day that if he continues to place a similar reliance upon this chemical footing, his chances of a new lease of the virtues of mother earth

are as wide as ever. His schools of practical agriculture have also been a clean failure, and ever will be, until they are actually made practical in every detail. With all his long experience and natural advantages, the British farmer is no longer able to meet the foreign farmer in the same market, and it is very unlikely that more schooling will make up the want. The reasons are deeper and more private.

The continental European farmer has been more cautious, more conservative and more frugal than the Britisher. He has also called in the aids of science, but, while searching and trying, he has not built upon anything until long practice in the field has more than doubled the proofs. Neither has he aimed at much in teaching the field practical, because, it may be, of the same caution that accompanies his conservatism, so that he has not failed where others have, in this respect.

Australia and New Zealand are now trying to obtain more agricultural light, by the establishment of agricultural schools and experimental stations in association. It will be gratifying to hear of their success, and having the advantage of the trials, failures and successes of others, we may look for something very good ere long.

Agricultural education has already a history of a quarter of a century in the United States, and such has been the varied results among its many establishments, that all we can do is to sympathize, and advise to try again. There is plenty of push, and were there more of steadiness and keeping on the proper track, our neighbours would lead the world in agricultural education, as much as they do in most other professions.

And what of our own progress? Have five years helped to solve the problem of agricultural education in Canada? If expression of public opinion is always reliable, we are doing well; if Legislative support is much, we need not be ashamed of the record; and if patronage by the young men of the country is everything, then our success is very large, but are all these certain evidence of a want fully met and of work thoroughly done? May not a high popularity be one of the most dangerous and false positions in a state, especially from a previous history of considerable odium?

Evidence, above all these questions, is the cue to our value. Farmers' sons, and the sons of men not farmers, who are all making for farming, and who have been, or are now, with us from England, Scotland, Ireland, Switzerland, the United States, and most of our own Provinces, are telling in various way what we have done for them. It is because of doing one thing only that success is ours; we teach *agriculture*—not the languages, nor military tactics, nor even the higher mathematics or mechanics; it is also because we teach practically. Soil is what we find and handle—not what a book tells; manures must be tested, crops thoroughly judged; cultivation a thing of individual *doing* on the part of every student, and an animal is one only when seen, handled, and compared with others in every detail. It is also because labour is compulsory, and not optional, on the part of students requiring it; and part of our success, I think, is due to the fact that we *teach*, and do not *lecture*.

Coming here, a young man sees at once that everybody is in earnest; saddle horses, buggy-driving, city-idling, or *looking-on*, are not part of the curriculum, and consequently he either bids us good-bye, or acts the *man*. In his progress through the initiatory stages of out-door duties, he is sharp enough to see that the sooner he is out of them the better for himself in the matter of debit and credit—for instruction means no pay. Once past this, there is keen competition for excellence, for superintendence of others, for teachers' confidence, and honour in all things; and as he gradually masters the science and practice of his profession, he finds he can obtain a situation as farm manager, and ere long will manage to find his own farm.

As a whole, therefore, I consider the problem of agricultural education is being gradually and surely unfolded in our case.

I have the honour to be, Sir,

Your obedient servant,

WM. BROWN.

APPENDIX.

INVENTORY AND VALUATION OF OUTSIDE DEPARTMENTS.

Farm,—Live Stock.

Horses.

12 Working Horses	$1,450 00	
		$1,450 00

Cattle.

Shorthorns:		
1 Two-year-old Bull	200 00	
5 Cows	1,125 00	
2 Two-year-old heifers	200 00	
2 One-year-old heifers	100 00	
2 Calves—Heifers	75 00	
		1,700 00
Herefords:		
1 Five-year-old bull	400 00	
2 Cows	800 00	
1 Two-year-old heifer	300 00	
1 One-year-old heifer	175 00	
1 Heifer calf	100 00	
		1,775 00
Devons:		
1 Five-year-old bull	175 00	
1 Cow	150 00	
1 One-year-old heifer	175 00	
1 Heifer calf	50 00	
		450 00
Aberdeen Polls:		
1 Five-year-old bull	200 00	
3 Cows	750 00	
2 Two-year-old heifers	250 00	
1 Heifer calf	40 00	
		1,240 00
Galloways:		
1 Cow	90 00	
		90 00
Ayrshires:		
1 Five-year-old bull	100 00	
4 Cows	400 00	
1 yearling heifer	50 00	
1 Calf	30 00	
		580 00
Grade Shorthorns:		
13 Cows	520 00	
3 One-year-old heifers	60 00	
4 Steer calves	100 00	
1 Short-horn Ayrshire, cross calf	10 00	
2 Heifers—Calves	25 00	
1 Galloway Shorthorn calf	10 00	
1 Aberdeen Poll cross calf	20 00	
		745 00

Grade Herefords:		
1 Steer	$20 00	
1 Calf	10 00	
		$30 00
Fattening Stock:		
5 One-year-old steers	160 00	
2 Aged oxen	150 00	
		310 00
SHEEP.		
Cotswolds:		
1 Three-shear ram	120 00	
40 Breeding ewes	1,200 00	
8 Ewe lambs	160 00	
7 Ram lambs	175 00	
		1,655 00
Shropshire Downs:		
5 Ewes	250 00	
1 Three-shear ram	150 00	
		400 00
Leicester:		
1 Five-shear ram	75 00	
18 Breeding ewes	540 00	
3 Ewe lambs	60 00	
2 Ram lambs	50 00	
		725 00
Southdowns:		
1 Three-shear ram	150 00	
19 Breeding ewes	480 00	
3 Ram lambs	90 00	
5 Ewe lambs	100 00	
		820 00
Oxford Downs;		
1 Two-shear ram	150 00	
6 Breeding ewes	300 00	
1 Ewe lamb	20 00	
1 Ram lamb	35 00	
		505 00
Merino:		
1 Two-shear ram		150 00
Grades:		
13 Breeding ewes	100 00	
3 Ewe lambs	15 00	
		115 00
Grades, feeding:		
20 Wether lambs	120 00	
		120 00
PIGS.		
Berkshires:		
1 Imported boar	100 00	
1 Boar	50 00	
5 Brood sows	200 00	
1 Imported sow	65 00	
2 Seven month boars	60 00	
		475 00
Prince Albert Windsor:		
2 Brood sows	100 00	
		100 00

Dogs.		
3 Dogs—Scotch collies	$85 00	
		$85 00
Total		13,530 00
Implements.		
4 Waggons	$180 00	
1 Democrat	45 00	
2 Carts	49 00	
8 Sets of double-trees	15 00	
4 Neck-yokes	4 00	
3 Pair of bob-sleighs	67 50	
1 Long sleigh	18 00	
1 Pleasure sleigh	36 00	
2 Seed drills	99 00	
1 Broadcast seeder	15 00	
2 Reapers	115 00	
4 Mowers	160 00	
1 Pea-harvester	18 00	
3 Horse rakes	40 00	
2 Cultivators	34 00	
1 Horse-power	35 00	
1 Jack	15 00	
1 Separator	80 00	
4 Shafts	12 00	
1 Drag sawing machine	60 00	
3 Fanning mills	50 50	
1 Circular Saw	30 00	
Wheelbarrows, curry combs, brushes, oil cans, wrenches, saws, hammers, axes, mallets	40 00	
4 Iron ploughs	72 00	
4 Iron beam ploughs	50 00	
1 Metal beam plough	10 00	
1 Wooden plough	10 00	
		1,360 00
1 Double mould-board plough	28 00	
2 Gang ploughs	35 00	
1 Sub-soil plough	20 00	
3 Ploughs, with wheel and skimmer	35 00	
1 Turnip drill	10 00	
4 Sets iron harrows	60 00	
2 Sets wooden harrows	10 00	
1 Wooden roller	25 00	
Shovels, spades, forks, and stone-boat	60 00	
5 Sets of team harness	135 00	
6 Sets of plough harness	55 00	
2 Sets of cart harness	20 00	
1 Barn truck	4 00	
1 Set of weigh scales	20 00	
1 Platform scales	90 00	
Half-bushel measures, horse-blankets, bags, chains, picks, baskets, scythes, grain cradles, hoes, hooks, etc	110 00	
5 Hay racks	35 00	
1 Water cart	68 00	
1 Straw-cutter and belts	53 00	
2 Grain crushers	75 00	

1	Cake crusher	$20 00	
3	Root slicers and pulpers	75 00	
70	Cattle chains	28 00	
4	Bull leaders	4 00	
2	Feed boilers	25 00	
	Sheep racks, troughs	75 00	
2	Cross-cut saws	6 00	
1	Vertical 6 horse-power boiler	190 00	
1	Portable steam engine	750 00	
1	Thresher	450 00	
			$2,571 00

GARDEN.

1,500	Flower pots	$60 00	
4	Rakes	4 00	
16	Spades	20 00	
7	Shovels	10 00	
10	Draw hoes	6 00	
5	Dutch hoes	3 00	
1	Scythe and snaith	1 50	
2	Garden ploughs	20 00	
1	Cultivator	8 00	
2	Wheel-barrows	6 00	
5	Screens	5 00	
2	Trowels	1 00	
5	Pruning saws	4 00	
4	Manure forks	3 00	
5	Potato forks	4 00	
2	Garden reels and lines	3 00	
2	Tree scrapers	0 50	
5	Hammers	3 00	
2	Pair of edging shears	4 00	
2	Pair hedge shears	4 00	
6	Watering pots	7 50	
2	Pair of pruning shears	4 00	
1	Syringe	5 00	
8	Pruning knives	4 00	
16	Hot-bed lights	30 00	
3	Picks	3 50	
	Knife, bill, hook, dibble	5 00	
1	Set cart harness	8 00	
1	Garden cart	40 00	
1	Gravel screen	15 00	
1	Set garden harrows	10 00	
1	Garden roller	10 00	
2	Garden sickles	0 50	
2	Edging knives	2 00	
4	Spuds	1 00	
1,000	Greenhouse plants	800 00	
1	Stove	13 00	
3	Potato dusters	1 00	
1	Seed drill	7 00	
1	Steel square	2 00	
	Compass, plyers	1 00	
6	Baskets	1 50	
3	Thermometers	1 50	
10	Marking irons	10 00	
2	Axes	3 50	

16	Hyacinth glasses	$1 00	
1	Office desk	2 50	
6	Pick handles	1 50	
4	Hay rakes	0 50	
3	Markers	0 75	
1	Crow-bar	1 50	
4	Hand glasses	4 00	
2	Brooms	0 60	
1	Working horse	100 00	
2	Hand lawn mowers	22 00	
1	Single set of harness	14 00	
			$1,307 35

MECHANICAL DEPARTMENT.

9	Hand cross-cut saws	$9 00	
4	Rip saws	7 00	
3	Fine cross-cut saws	4 75	
1	Compass	1 00	
3	Draw-knives	3 00	
3	Braces	7 50	
1	Set of Bits	10 00	
1	Boring machine	6 00	
20	Gimlet bits	2 50	
3	Oil-stones	1 25	
6	Smoothing-planes	5 40	
1	Jointer	2 50	
6	Half-jointers	9 00	
7	Jack-planes	5 00	
1	Iron circular plane	4 50	
1	Set hollow and round No. 16	0 50	
1	" match ½ inch	0 85	
1	" " ⅞ "	1 25	
1	Centre bead ⅝ inch	0 75	
1	Side bead 1 "	0 40	
1	" ⅜ "	0 40	
1	" ¼ "	0 40	
1	" ⅝ "	0 40	
1	Rabbit plane 1½ inch	1 00	
1	" ¾ "	1 00	
11	Hammers	10 00	
3	Bench axes	4 00	
1	Broad axe	3 50	
1	Screw wrench	2 00	
2	Cold chisels	0 50	
3	Spoke-shaves	1 00	
5	Try squares	1 60	
1	Framing square	1 25	
1	Panel square	1 25	
4	Mallets	0 40	
1	Level	1 25	
2	Framing saws	2 50	
2	Trowels	1 00	
6	Screw drivers	2 40	
1	Chalk line	0 40	
1	Common line	1 25	
2	Tool bags	0 80	
1	Wire-tightener and apparatus	10 00	
1	Bench-brush	0 40	

5 Carpenter's benches	$35 00	
6 Ladders	6 00	
2 Scratchawls	0 10	
4 Paint brushes	3 00	
4 Five gallon oil-cans, and glue pot	4 50	
3 Gimlets	0 45	
1 Grindstone	5 00	
1 Stove	6 50	
Fencing tools, spade, spar, pick, mauls	10 00	
Block and tackle	12 00	
1 Ratchet drill and set of bits	6 00	
		$219 30

ABSTRACT OF INVENTORY AND VALUATION:

Farm—Live Stock	$13,530 00	
" Implements	3,931 00	
Garden	1,307 35	
Mechanical	219 30	
		$18,987 65

APPENDIX TO REPORT

OF THE

Commissioner of Agriculture and Arts.

APPENDIX (F).

REPORT OF THE ONTARIO POULTRY ASSOCIATION, FOR THE YEAR 1879-80.

REPORT

OF THE

ONTARIO POULTRY ASSOCIATION,

FOR THE YEAR 1879-80.

To the Honourable the Commissioner of Agriculture :

SIR,—I beg to submit the Report of the Ontario Poultry Association for the year 1879 and 1880, which, though brief, contains satisfactory evidence that the Society has already accomplished much for the promotion of the objects for which it was established, with a prospect of increasing usefulness for the future.

I have the honour to be, Sir,

Your obedient servant,

GEO. MURTON,

Guelph, December, 1880. *Secretary.*

REPORT.

The Directors of the Ontario Poultry Association, in making their Annual Report, beg to congratulate the members on the continued success attending their efforts to advance the poultry interests of the country, an evidence of which is manifest by the grand display of fowls at the late Exhibition held in the city of Guelph in the first week of February, which was acknowledged by all to be the best exhibit ever held in the Dominion.

A great impetus has been given to the Association and to the breeding of poultry by the Ontario Government's liberal appropriation of $600 towards its funds, and also by granting an Act of Incorporation, whereby it is now classed with the agricultural and other associations of the Province, and becomes a Provincial institution.

Your Directors feel that the interest would be further advanced if they were represented at the Council of the Agricultural and Arts Association, the same as the Dairy and Fruit Growers' Associations, and as we often see grave mistakes made in the prize list of the Provincial Exhibition from a want of knowledge, on the part of those directors, of the poultry interest.

It is too often the case that farmers take very little interest in the breeding and raising of poultry, thinking it is too small a matter for them to think about, but when we look at the returns from the Custom House of the exports from this country, we find that the value of eggs shipped from any given port for the season amounts to a very large sum. From the port of Guelph alone, the number of eggs exported to the United States in the seven months from April 1st to December 1st, 1879, was 797,134½ dozen, valued at $93,513.61, besides the large quantity of fat poultry shipped during the winter months.

From this it will be seen that the poultry business is not so small as some imagine, and only requires a little fostering care to make it a much more lucrative business.

At the late Exhibition there were nearly 1,100 entries, and these comprising specimens of some 34 varieties of fowls, besides a large selection of pigeons.

The Brahmas seem to be the general favourite, especially the light variety, and for symmetry and appearance certainly deserve all the encomiums passed upon them, although they, as well as the other varieties, have their special patrons, each claiming some peculiar quality for his favourites.

The Hamburgs are a class of fowls that claim great attention. They are a very handsome class, and are reported to be good layers, and the distinctive varieties of them make a grand display in any exhibition.

The Dorkings are an old established English breed, and perhaps make the best table fowl of any, and are considered fair layers, but seem to be rather tender, and therefore difficult to raise.

Plymouth Rocks are comparatively a new variety, originating, we believe, in the United States, some say a cross between the old Dominick and some Asiatic breed. However, they have now become a distinct class, and are considered hardy and pretty good layers.

Games, of which there are a great number of classes, have their patrons. They are also good table fowls, and pretty good layers, but owing to their disposition to wander about, and their natural inclination to fight, are not generally raised.

Houdans, a French fowl, are considered very hardy, and good layers, and are evidently coming into favour. When well attended they attain to a very respectable size.

Turkeys are always a very interesting portion of a poultry show, as nearly everybody feels interested in them, especially about Christmas and New Year's, when they make a very inviting appendage to the dinner-table. Of late years there has been a great improvement in them, from judicious crosses with the wild species. There are several varieties of this noble and useful fowl, but none exceed the Bronze for beauty, with their red legs and the rich metallic hue of their feathers. They are indeed a truly noble fowl, and often weigh from 40 to 50 lbs. per pair.

Geese and ducks likewise have their admirers, and many fine specimens were on exhibition. In geese the Toulouse seem to be the most sought after, and are, in fact, the finest variety, especially when we take size into account. There are many other varieties, such as the Bremen, China, African, Buff, and what are called Common Geese, which are all good in their classes, but with the exception of the Buff, do not come up to the Toulouse in size.

In ducks, the Aylesbury and Rouen take the lead, although several other varieties are much thought of. Under ordinary circumstances we would prefer the Rouen, as we consider them the hardiest, although the Aylesbury will attain the largest size in favourable quarters, such as plenty of running water, etc.

All of which is respectfully submitted.

GEO. MURTON,
Sec. O. P. Ass.

POULTRY ASSOCIATION OF ONTARIO.

STATEMENT OF RECEIPTS AND EXPENDITURE FOR 1879.

To Cash Receipts.

Entry fees	$436 45
Specials	32 00
Door receipts	118 99
Carried forward	$587 44

Brought forward	$587 44	
Members' subscriptions	42 00	
Government grant	700 00	
Commission on sales, &c.	17 03	
		$1,346 47
Balance due Treasurer		36 73
		$1,383 20

By Cash Disbursements.

By paid Prize account	$880 00	
" Brantford portion of Government grant	100 00	
" Salary of Secretary-Treasurer	100 00	
" Transfer of coops from Southern Poultry Society	80 00	
" Expenses account	206 46	
" Petty cash "	16 74	
		$1,383 20

APPENDIX TO REPORT

OF THE

Commissioner of Agriculture and Arts,

APPENDIX (G).

AMOUNT EXPENDED FOR THE ENCOURAGEMENT OF AGRICULTURE IN ONTARIO IN 1880.

No. 1.—Amounts paid to Agricultural Societies in 1880.

Name of Society.	Grant.	Name of Society.	Grant.
	$ c.		$ c.
		Brought forward	19,548 00
Addington	700 00	Hastings, West	700 00
Algoma	700 00	Huron, East	700 00
Brant, North	700 00	Huron, West	700 00
Brant, South	700 00	Huron, South	700 00
Bruce, North	700 00	Kent, East	700 00
Bruce, South	700 00	Kent, West	700 00
Brockville, E. D.	700 00	Kingston, E. D	350 00
Carleton	700 00	Lambton, East	700 00
Cardwell	700 00	Lambton, West	700 00
Cornwall, E. D.	350 00	Lanark, North	700 00
Dufferin	700 00	Lanark, South	700 00
Dundas	700 00	Lennox	700 00
Durham, East	700 00	Leeds, South	700 00
Durham, West	700 00	Leeds, North, and Grenville, North	700 00
Elgin, East	700 00	Lincoln	700 00
Elgin, West	700 00	London, E. D	350 00
Essex, North	700 00	Middlesex, North	700 00
Essex, South	700 00	Middlesex, East	700 00
Frontenac	700 00	Middlesex, West	700 00
Grenville, South	700 00	Monck	700 00
Grey, North	700 00	Muskoka	700 00
Grey, South	700 00	Niagara, E. D	350 00
Grey, East	700 00	Norfolk, North	700 00
Glengarry	700 00	Norfolk, South	700 00
Halton	700 00	Northumberland, East	700 00
Haldimand	700 00	Northumberland, West	700 00
Hamilton, E. D	350 00	Ontario, North	700 00
Hastings, North	648 00	Ontario, South	700 00
Hastings, East	700 00	Ottawa, E. D	350 00
Carried forward	19,548 00	*Carried forward*	38,448 00

No. 1.—Amounts paid to Agricultural Societies in 1880—*Continued.*

Name of Society.	Grant.	Name of Society.	Grant.
	$ c.		$ c.
Brought forward	38,448 00	*Brought forward*	48,948 00
Oxford, North	700 00	Stormont	700 00
Oxford, South	700 00	Toronto, E. D.	550 00
Peel	700 00	Victoria, North	700 00
Perth, North	700 00	Victoria, South	700 00
Perth, South	700 00	Waterloo, North	700 00
Peterboro', East	700 00	Waterloo, South	700 00
Peterboro', West	700 00	Welland	700 00
Prince Edward	700 00	Wellington, West	700 00
Prescott	700 00	Wellington, Centre	700 00
Renfrew, North	700 00	Wellington, South	700 00
Renfrew, South	700 00	Wentworth, North	700 00
Russell	700 00	Wentworth, South	700 00
Simcoe, East	700 00	York, North	700 00
Simcoe, West	700 00	York, East	700 00
Simcoe, South	700 00	York, West	700 00
Carried forward	48,948 00	Total	$59,298 00

No. 2.—Total payments for encouragement of Agriculture and Arts in 1880.

Service.		Appropriation.	Expended in 1880.	Unexpended or Over-expended.
		$ c.	$ c.	$ c.
Electoral District Agricultural Societies		59,350 00	59,298 00	*52 00
Outlying Districts—Haliburton, $150		300 00	150 00	*150 00
Agricultural and Arts Association		10,000 00	10,000 00	
Western Dairymen's Association		1,500 00	1,500 00	
Eastern Dairymen's Association		1,500 00	1,500 00	
Ontario Poultry Association		700 00	700 00	
Ontario Fruit Growers' Association		1,800 00	1,800 00	
Ontario Entomological Society		1,000 00	1,000 00	
Sundries:				
S. P. May, travelling expenses *re* Mechanics' Institutes	$895 50			
L. W. Ord, ditto	8 00			
Rolph, Smith & Co., Engraving	142 20			
W. Warwick & Sons, Binding	603 05			
C. B. Robinson, Printing	524 54			
J. Notman, Paper	631 73			
H. E. Clarke, Satchel	6 00			
Willing & Williamson, Prize Books	20 00			
J. B. Aylsworth, inspecting Loughboro' Agricultural Society	7 00			
A. Piddington, Post Cards	31 25			
D. Stirton, Postage, &c.	51 08			
W. Rennie, Seeds	9 75			
T. Mechan do	7 50			
G. Leslie, Travelling Expenses	21 25			
T. Beall, " "	17 41			
D. W. Beadle, Travelling Expenses	14 00			
P. C. Dempsey " "	19 35			
E. G. Allen, Specifications	36 07			
G. Buckland, to pay Sundries	9 05			
"Six Nations" Agricultural Society	50 00			
		2,000 00	3,104 73	†1,104 73
Total		78,150 00	79,052 73	†902 73

* Unexpended. † Over-expended.