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During 1985-6, the first stage of a project to facilitate access to the industrial data of the 1871 manuscript census has been sheltered by the Department of Geography, University of Guelph. The work has been assisted by a grant from the Social Sciences and Humanities Research Council of Canada.

The objectives of the project have been:

1. To make accessible the complete unpublished data of the 1871 manuscript census of industrial establishments for urban centres in Ontario — in systematic, standardized machine-readable format to serve the research interests of economic, business, urban and social historians, historical geographers, industrial archaeologists and historians of technology and material culture.
2. To add coded details of Standard Industrial Classification and location to data for individual establishments, which may then be aggregated into industrial sectors and geographical units in ascending levels of generalization.
3. To compare results of aggregating data from the manuscript census with published totals produced in the 1871 Census volumes for census/electoral districts.
4. To relate the lists of establishments produced for particular places to details from such other contemporary sources as the Dun reference books and county/city directories.
5. To use the fully verified and edited database for statistical analysis of such important questions as the transition from artisanal craft to factory in the organization of industrial capitalism; inter-industry and rural-urban differences in productivity; and the relationship between industrialization and urban growth.
6. To continue exploring the possibility, with other interested scholars, of extending the project to all four provinces of Canada enumerated in the 1871 census — Quebec, New Brunswick and Nova Scotia as well as Ontario.

The Source

The manuscript schedules on industrial establishments, recently made available on microfilm as part of the whole

1871 manuscript census by the Public Archives of Canada, constitute a uniquely valuable source. Although similar details were collected in the censuses of 1881, 1891, 1901 and 1911, none of the manuscript schedules for these years have survived. While the 1861 census manuscripts have survived, their format is much more awkward to use, the industrial details being interspersed through the household schedules. Moreover, the 1871 manuscript schedules contain a wealth of information which was not published at the time.

The 1871 census enumerators recorded the following details for each industrial enterprise they included:

- Name of the proprietor(s),
- Statement of type of establishment/nature of product,
- Value of fixed capital and of floating (working) capital,
- Number of working months in the year,
- Average numbers employed, distinguished into males and females over 16 years, boys and girls under 16 years,
- Motive power other than manual (water, steam, horse) with the nominal force stated in units of horse power,
- Quantities and values of specified raw materials,
- Quantities and values of manufactured products.

Industrial statistics published in the 1871 census reports were organized primarily by the various industrial types. Summary data only were published for each of the 206 census districts (90 in Ontario). No industrial data at all were published for areal units smaller than whole census districts, whether as summaries of total industrial activity or for specific industrial types. Thus the only 1871 industrial information published for urban centres in Canada was for the six cities, the boundaries of which coincided with those of one or more census districts: Montreal, Toronto, Hamilton, Ottawa, London and Kingston.

Project Procedures

In this first major phase of the work, the manuscript details for 6,825 industrial establishments in 146 urban or proto-urban centres have been made machine-readable. These establishments constituted 44 per cent of all reported for Ontario in the published volumes of the 1871 Census of Canada, but 61 per cent of Ontario's total industrial employment and 64 per cent of total provincial production. They also represent 20 per cent of all industrial establishments recorded for the four Canadian provinces included in

the 1871 Census, but 28 per cent of total industrial employment and 33 per cent of industrial production in the four provinces.

Details for all industrial establishments located within Ontario urban and proto-urban centres were read from the micro-filmed manuscript schedules. All data, except for volumes of raw materials and of products, were coded in preparation for data entry. It was decided to exclude volume data because of the extreme variety of materials and units of measurement involved. Each establishment was assigned an SIC code, according to the Dominion Bureau of Statistics, Standard Industrial Classification Manual (revised 1970). This system was adapted to the conditions of 1870 by adding suffixes to provide closer specificity of industrial type(s). Details of town name, census district name and census enumerator's division were also coded for each establishment.

In the early stages of the project, details were coded for data entry by keypunch operators to the mainframe computer. Procedures were later adapted, when an IBM-AT microcomputer was acquired for the project. Every record has the following fields in a dbase III file structure:

Intensive procedures were developed, for verifying basic data and for editing the database so that it is suitable for statistical analysis, for indexing, search and retrieval, for online transmission or copying on diskette to other users; and for printing in hard copy.

Particular attention was paid to the accuracy and consistency of the SIC designations and to verifying the numeric data for capital, employment, wages, raw materials and value of production. Proprietors' names and types of establishment/product were also checked against lists in the Dun reference books, directories and historical atlases. In cases where the census enumerator's spelling of the proprietor's name differed significantly from that in a contemporary printed source, while clearly referring to what was the same establishment, the record was "corrected" if this would result in a more plausible or conventional rendering of the name.

Research Potential

Our research project now enables the data for any industrial establishment to be retrieved easily; details for groups of establishments may also be aggregated by geographical unit or industrial type. Both potentialities are likely to interest scholars in a variety of disciplines, including urban history.

Structure of URBIND71.dbf

Field	Field Name	Type	Width	Meaning
1	TOWNID	Character	3	ID code for city/town/village
2	CED	Character	3	Census enumerator's division
3	ESTNUM	Character	3	Establishment number — MS sequence
4	PROPRIOR	Character	20	Name(s) of proprietor(s)
5	TYPEST	Character	20	Type of establishment/product
6	MONTHS	Character	2	Number of working months in year
7	SIC	Character	11	Standard Industrial Classification Code
8	TYPEPOW	Character	5	Type of motive power (other than manual)
9	FORCE	Numeric	3	Nominal power (HP)
10	FIXCAP	Numeric	7	Fixed capital(\$)
11	FLOCAP	Numeric	7	Floating capital (\$)
12	EMPMEN	Numeric	3	Number men employed
13	EMPWOM	Numeric	3	Number women employed
14	EMPBOY	Numeric	3	Number boys employed
15	EMPGIRL	Numeric	3	Number girls employed
16	WAGES	Numeric	7	Total wages (\$)
17	RAWMAT	Numeric	7	Cost of raw materials (\$)
18	PRODUCTS	Numeric	7	Value of production (\$)
19	TOTEMP	Numeric	3	Total number employees
20	TOWNNAME	Character	15	Full name city/town/village
21	CDISTRIC	Character	23	Full name of census district
22	CDID	Character	4	ID code for census district

** Total **

163

Table 1 Data for the larger industrial establishments in St. Catharines in 1870 (those employing 10 or more workers).

PROPRIETOR	TYPE ESTABLISHMENT	SIC CODE	POWER	FORCE	FIXCAPITAL	FLOCAPITAL	EMP MEN	EMP WOM	EMP BOY	EMP GIRL	TOTEMP	WAGES	RAWMAT	PRODUCTS	TOWNNAME
DUTTLE/DALE/RODDEN	AGRC HAND TOOLS	306	WATER	350	75000	85000	120	0	0	0	120	55000	36000	137000	ST CATHARINES
STRICKLAND LEWIS	SHIPBUILDING YARD	327	WATER	50	20000	20000	80	0	2	0	82	25000	30000	48000	ST CATHARINES
MCKINLEY R & CO	CARRIAGE WOODWORK	329-P	STEAM	40	26000	20000	52	0	8	0	60	21000	30000	85000	ST CATHARINES
OILLE G & J	FOUNDRY/MACHINE SHOP	294/308	STEAM	12	18000	6000	50	0	0	0	50	16000	6000	30000	ST CATHARINES
BOLES WILLIAM	TAILOR	242		0	800	0	17	28	0	0	45	14000	20000	37500	ST CATHARINES
DOLSON SAMUEL G	BUILDER/PLANING MILL	421-B/251	STEAM	15	6000	5000	40	0	0	0	40	13000	14600	29000	ST CATHARINES
TAIT JAMES D	FURS /MANTLES	246/249		0	500	10000	1	25	0	5	31	5500	9260	20000	ST CATHARINES
SMITH R H	SAW FACTORY	306-S	STEAM	18	25000	5000	31	0	0	0	31	18000	35000	55000	ST CATHARINES
NORRIS JAMES	FLOUR MILLS	105	WATER	20	45000	150000	25	0	0	0	25	10000	575000	640000	ST CATHARINES
NORRIS JAMES	COOPERAGE	259-C		0	6000	15000	25	0	0	0	25	9000	16000	28000	ST CATHARINES
YALE & CO	FOUNDRY	294	STEAM	10	18000	9000	25	0	0	0	25	8000	10000	25000	ST CATHARINES
DOUGAN JAMES	CARPENTER/BUILDER	421-C/421-B		0	3000	5000	25	0	0	0	25	10000	10000	25000	ST CATHARINES
NEELON SYLVESTER	COOPERAGE	259-C		0	5000	9000	20	0	5	0	25	6000	18200	26250	ST CATHARINES
LEPPER JOHN	TAILOR	242		0	200	7000	6	16	0	0	22	5000	10000	20000	ST CATHARINES
HEALEY TIMOTHY	BOOTS & SHOES	174		0	350	4000	18	2	1	1	22	7000	8000	18000	ST CATHARINES
SMITH GEORGE	CARRIAGE SHOP	329-C		0	8000	3000	18	0	3	0	21	6240	6550	15000	ST CATHARINES
BENFIELD W S	BRICK YARD	351-B	HORSE	2	250	1500	16	0	4	0	20	3000	200	3500	ST CATHARINES
COLLIER HENRY	AGRC IMPLEMENTS	311	STEAM	15	10000	25000	20	0	0	0	20	7200	7200	20000	ST CATHARINES
NEELON SYLVESTER	FLOUR MILL	105	WATER	50	25000	80000	15	0	5	0	20	8000	385000	447120	ST CATHARINES
BURROW/CHATFIELD/CO	SHEET METAL FITTERS	304		0	1000	10000	16	0	2	0	18	4000	10000	20000	ST CATHARINES
MCINTYRE & SON	CABINETS/UNDERTAKER	261/258	WATER	0	1000	2500	12	4	1	0	17	5200	1500	12000	ST CATHARINES
HELLEMS & JACKSON	PLANING/SASH/BLINDS	251/254	STEAM	20	7000	8000	10	0	7	0	17	4000	10000	18000	ST CATHARINES
GILLESPIE & SIMPSON	SAW MILL	251	WATER	30	5000	10000	10	0	6	0	16	4000	19000	25000	ST CATHARINES
HOLMES & GREENWOOD	CARRIAGES/WAGONS	329-C		0	1000	4000	15	0	0	0	15	3323	2000	10000	ST CATHARINES
COUPER & CRAIG	TAILORS	242		0	0	1000	10	4	0	1	15	3500	14000	21000	ST CATHARINES
ORR JAMES	PAINT SHOP	421-D		0	0	400	10	0	4	0	14	1600	1000	2600	ST CATHARINES
WELLAND RAILWAY CO	MACHINE SHOPS	326	STEAM	12	0	0	14	0	0	0	14	5500	1500	7200	ST CATHARINES
TAYLOR & BATE	BREWERY	109-B		0	10000	10000	12	0	0	0	12	4080	12500	22000	ST CATHARINES
HARRIS & BERSTON	CIGAR	153		0	150	15000	8	0	0	4	12	3600	1200	10000	ST CATHARINES
ABBOTT JOHN W	SEWING MACHINES	315-S	STEAM	3	10000	5000	12	0	0	0	12	6000	3000	20000	ST CATHARINES
MCNEIL JAMES	CARPENTRY	421-C		0	100	700	10	0	2	0	12	3900	5366	10000	ST CATHARINES
MOYER P E W	PRINTING/NEWSPAPER	289/286		0	5000	5000	8	0	3	0	11	2500	1500	4500	ST CATHARINES
RESTON VIOLET	DRESSMAKER	244		0	0	0	0	2	0	8	10	0	100	600	ST CATHARINES
CARNALL REBECCA	MILLINERY/CLOTHES	249-M/245		0	0	500	0	10	0	0	10	800	1000	8500	ST CATHARINES
WILSON GEORGE	CARPENTER/JOINER	421-C		0	5000	3000	10	0	0	0	10	4600	1800	7600	ST CATHARINES

Source: URBIND 71 databank, compiled from 1871 manuscript census schedules.

Table 2 Ontario urban centres in 1870, ranked by size of industrial work force: the top 45 centres.

TOWN NAME	POP	ESTAB	CAPITAL	EMPLOY	WAGES	RAWMAT	PRODUCTS	FORCE-HP
TORONTO	56092	542	4428650	9653	2696531	7098197	14544699	2147
HAMILTON	26716	326	1578164	4785	1375611	2900141	5634044	1236
OTTAWA	21745	233	1095420	3210	880057	2565976	4176610	2199
LONDON	15826	216	1026834	2295	699287	1999254	3551520	535
ST CATHARINES	7864	158	506352	1416	425052	1731661	2584700	750
KINGSTON	12407	158	534155	1317	347209	721795	1362756	201
BRANTFORD	8107	98	794295	1258	424602	916309	1835577	442
GUELPH	6878	109	486715	1131	376487	1057379	1901500	608
BELLEVILLE	7305	102	285970	914	213748	325998	810465	641
GALT	3827	74	395726	796	226843	663293	1217110	561
PETERBOROUGH	4611	96	311595	759	214282	397949	775095	396
OSHAWA	3185	41	379450	732	259350	612776	1095780	274
CHATHAM	5873	95	268540	716	234481	465325	916980	492
BROCKVILLE	5102	110	185089	706	192122	290206	628315	196
DUNDAS	3135	64	495430	682	182575	461824	882477	673
INGERSOLL	4022	69	314090	627	194917	523194	856212	430
PORT HOPE	5114	77	263450	560	155273	530183	875000	348
ALMONTE	2080	46	326051	553	125708	438423	645050	530
STRATFORD	4313	82	193650	538	128482	409107	720206	241
COBOURG	4442	87	285550	501	131545	411149	642217	266
WOODSTOCK	3982	72	166595	453	114200	312357	510065	335
LINDSAY	4049	75	237400	446	124797	375663	659391	676
STRATHROY	3232	62	154150	437	111120	266820	504400	291
MERRITTON*	1000	10	373500	429	96136	264060	596917	690
GANANOQUE	2020	49	200900	419	113760	280135	604170	759
BOWMANVILLE	3034	60	133370	417	118170	342744	560305	216
BARRIE	3398	74	144065	410	128658	120350	346000	322
PARIS	2640	45	186120	410	108120	547082	844367	282
ST MARYS	3120	71	122220	396	91359	270100	457126	289
GODERICH	3954	65	196560	388	101823	638326	892230	561
NAPANEE	2967	62	127415	383	85936	307714	514200	504
DESERONTO*	500	6	64300	349	58310	97615	196554	150
PORT PERRY*	1500	31	90500	335	74810	104297	246405	295
CARLETON PLACE	1205	31	104350	333	76756	212975	357801	357
SMITHS FALLS	1150	43	135425	328	93241	238186	463668	451
COLLINGWOOD	2829	49	192000	327	78796	235537	434553	435
PERTH	2375	77	119047	321	73006	134199	283836	124
OWEN SOUND	3369	81	108947	320	72742	161646	338792	215
PICTON	2361	73	93570	318	77814	104558	268944	76
BERLIN	2743	68	92360	307	55675	165525	323619	204
PRESCOTT	2617	39	140200	303	100888	170373	479184	225
HAWKESBURY	1671	39	145150	301	53590	487224	673405	317
ST THOMAS	2197	72	65325	289	74881	154973	331151	175
GEORGETOWN	1282	35	107150	283	64818	256300	386318	321
FERGUS	1666	42	151210	281	85128	309960	511402	492
*** Total ***	269505	4114	17807005	42132	11718696	31078858	57441116	21928

Source: URBIND 71 databank, compiled from 1871 manuscript census schedules

The 6,825 records of individual establishments in the master databank are arranged in the order in which they were enumerated for each urban or proto-urban centre. They are primarily retrievable in that order, within the framework of census district, census sub-district and enumerator's divisions. But the records may be indexed on any field to achieve other systems of order. Table 1, for example, lists the largest establishments in the town of St. Catharines, sorted by size of workforce. But the same list might have been indexed in alphabetical order of the proprietor's name, or in Standard Industrial Classification order, or by value of production.

The entire databank may also be indexed and sorted *en bloc*, without regard to town location. Thus it is possible to group all establishments of the same industrial type by indexing on the SIC code or to rank establishments by size of workforce or by value of production.

Because individual establishment records are precisely coded for geographic location and industrial classification, it is also possible to aggregate their numeric data into successively larger groupings or areas, including whole towns. Table 2 illustrates this capability with a summary of the industrial data for the top 45 urban centres of Ontario in 1870, ranked by industrial workforce. These data, never previously compiled, are being added to time-series industrial statistics published in the decennial Census of Canada from 1881 to 1911 and, annually from 1916, by the Dominion Bureau of Statistics. It then becomes possible to measure and interpret long-run changes in the regional urban system

and the urban economic base. It is interesting, for example, that only 15 of the top 30 urban centres in Table 2 still ranked among the top 30 industrial centres by 1930.

In the next phase of the research project, we are taking two directions. One is to make a feasibility study of extending the databank to include rural Ontario and the other three provinces in 1870 — Quebec, New Brunswick and Nova Scotia. The other is to apply statistical analysis techniques to the records already in our databanks, in order to investigate major questions in the history of Canadian economic and social development. Questions of interest to urban historians include: How did the processes of urbanization and industrialization interact? What were the critical factors and stages in the concentration of industry in urban places? How did manufacturing industry stimulate general urban growth? Why did some cities and towns achieve rapid or steady growth while others stagnated or declined? To what extent was differential growth determined by broad situational and economic forces, and how much scope was there for human and institutional agency?

A research report is available, describing the objectives and project procedures and outlining the research potential: Elizabeth Bloomfield, Gerald Bloomfield and Janine Grant, with Peter McCaskell, *Industry in Ontario Urban Centres, 1870: Accessing the Manuscript Census* (1986), 60 pp. It may be ordered from Publications, Department of Geography, University of Guelph, Guelph, Ontario, N1G 2W1, for \$7.00 (prepayment required).