

## Locating Selected Occupations: Ottawa, 1870

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Number 2-74, October 1974

URI: <https://id.erudit.org/iderudit/1019661ar>

DOI: <https://doi.org/10.7202/1019661ar>

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### Publisher(s)

Urban History Review / Revue d'histoire urbaine

### ISSN

0703-0428 (print)

1918-5138 (digital)

[Explore this journal](#)

### Cite this article

Cross, D. (1974). Locating Selected Occupations: Ottawa, 1870. *Urban History Review / Revue d'histoire urbaine*, (2-74), 5–14. <https://doi.org/10.7202/1019661ar>

## LOCATING SELECTED OCCUPATIONS: OTTAWA, 1870

Evidence of the increasing interest of historical geographers and historians in the urban past is shown in the recent literature and in the development of a recent conference on urban North America.<sup>1</sup> The themes of mobility, residential patterns, class structure and occupational structure within the city appear to be of particular interest. The present study takes the form of a preliminary and exploratory investigation into the occupational structure of Ottawa in 1870 and seeks to add to a growing Canadian literature.<sup>2</sup>

## METHOD

Data on eight occupations, stratified into four categories were gathered from the *City of Ottawa Directory for 1870-71*.<sup>3</sup> Goheen's classification of occupations<sup>4</sup> was used as the means of selecting representatives of the professional, retail, skilled and semi-skilled sections of the labour force. These data were located with the aid of the *Insurance Plan of Ottawa City*,<sup>5</sup> which showed street numbers for each lot. They were then mapped using a base map found in the *Illustrated Historical Atlas of the County of Carleton*.<sup>6</sup>

Visual examination of the maps permitted preliminary analysis of the distributional pattern of activities. However, in the belief that visual observation alone is not always a reliable indicator of pattern the technique of Nearest Neighbour Analysis was used, wherever possible, to substantiate direct observation.<sup>7</sup> Developed by plant ecologists<sup>8</sup> to describe the distribution of living organisms in their natural environments, Nearest Neighbour Analysis has been extensively used by geographers.<sup>9</sup> The statistic<sup>10</sup> measures the departure from randomness of a distribution<sup>11</sup> based on the measures of observed ( $\bar{r}_A$ ) and expected ( $r_E$ ) distances between neighbours within the limits of a defined area. The values obtained range between the limits of zero (indicating clustering) and 2.149 (indicating uniform distribution) while the value of one represents randomness. The significance of the Nearest Neighbour value is tested by the use of the "standard variate of the normal curve"<sup>12</sup> - that is C. This statistic

measures "...the significance of departure of  $\bar{r}_A$  from  $\bar{r}_E$  by the normal curve."<sup>13</sup>

Using the data of Figures 1-4, distance from each point to its nearest neighbour was measured and the Nearest Neighbour statistic was calculated. Despite the small absolute numbers involved in a few cases, a fact which might limit the usefulness of the technique, Nearest Neighbour statistics were calculated for all eight occupations. The results are presented in Table 1.

### *RESULTS*

In 1870 the most centralized or clustered of the occupations was the legal profession. The Canal junction of Rideau Street, Wellington Street, and Sparks Street was an important focus for these individuals (Figure 2). Many of the lawyers' offices were to be found in the Post Office Building at the corner of Sparks and Elgin Streets. The importance of this location to the lawyers was the proximity to the Registry Office which was on Elgin Street near Queen Street, only about a block south of these offices. This location also offered easy access to the route across the Canal to the Court House on the east side of the Canal. Seventeen lawyers' offices were located at the junction of Rideau, Wellington and Sparks Streets. A further two offices were located near the Court House and of the two remaining, one was one block south of the Registry Office and the other was on Sussex Street one block south of Rideau Street. Thus the visual compactness of the lawyers can be readily observed; an observation supported by a rho value of 0.1438, this being significant at the one percent level of confidence.

Chemists and druggists were retail enterprises which might be expected to concentrate on the already established retail areas. Therefore their location on Rideau Street, Wellington Street, and Sparks Street comes as no surprise. That six out of nine of them are located within one block east or west of the Canal is also significant. This area around the Canal, where Rideau Street, Wellington Street and Sparks Street converge, was a fairly important location in Ottawa in 1870. Chemists and druggists can be seen to have been relatively clustered around this location (Figure 1).

The Nearest Neighbour statistic of 0.1503 (significant at the one percent level of confidence) also indicates clustering.

Butchers were another group of people who shared this common need for a central location. As Figure 1 indicates, there were distinct clusters of butchers in Ottawa in 1870. These were in the Wellington Ward and By Ward market areas. A value closer to clustering might have been obtained if the two areas had been analysed separately. Nevertheless a value of 0.2332 shows a marked tendency towards clustering and this value proved significant at the one percent level of confidence. Today this clustering can still be seen in the By Ward market area. In 1870 several shops were located outside this market area, for instance in the Rideau Street and Chaudière Falls areas.

The next two most clustered professions, shoemakers and blacksmiths are skilled and semi-skilled occupations respectively, but they are also dependent on the retailing or marketing of their goods or trades. Thus, although they have locations in all parts of the city they tend to concentrate somewhat on the retail and business sections. Their Nearest Neighbour values were 0.3495 and 0.4445 respectively, both significant at the one percent level of confidence. Both occupations were relatively low order services, that is they offered goods or services used frequently by the population. Thus they had to locate in each section of the city to be near their markets. In 1870 there was some focusing on the Rideau-Sparks Street area near the Canal. An Examination of Goad's Insurance Plan showed that blacksmiths (Figure 3) were often associated with hotels. Therefore transient customers could be relied on as well as the local population. Shoemaker (Figure 4) have a slightly greater tendency to locate in both central areas and local semi-retail and residential areas.

As Figure 2 shows, doctors' offices would seem to have been less clustered. Nearest Neighbour Analysis supports this view with a value of 0.5547 significant at the one percent level of confidence. Doctors' offices are evenly divided between the areas east and west of the Canal. In the Wellington Street area there was a small cluster at the Sparks Street-Elgin Street junction, with five others evenly distributed along Wellington Street. The doctors generally lived and worked at home. Only

three were listed in the Directory with separate residence and office addresses. Possibly doctors at this time were not specialized and therefore located a fair distance from each other but within residential areas in order to be near their patients. If any specialization was in practice, the small cluster at Sparks and Elgin Streets probably represented this phenomenon.

The doctors showed a tendency to locate along either Wellington Street or Rideau Street. In order to confirm the apparent linearity of this pattern a Reflexive Nearest Neighbour program was run.<sup>14</sup> The results, however, did not support the hypothesis of linearity. In fact the statistic,  $R_0$ , changes very little with each step in the order of neighbours from one to six (see Table 2).

Cabinet-makers and carpenters and builders were the least clustered occupations of those studied. Most of the cabinet-makers were located in the eastern part of the city but there were no shops south of Rideau Street (Figure 4). The Nearest Neighbour value was 0.7409 but this did not prove to be significant. The validity of this result may be weakened by the small size of sample. The location of cabinet-makers may, perhaps, be explained in terms of commerce. Presumably cabinet-makers were commerce-oriented and therefore they chose locations near the commercial centres. Rideau Street was a long established commercial area and thus the three shops located so close to the artery could have been commerce-oriented. Also five of the seven cabinet builders were within three blocks of either the By Ward or Wellington Ward markets.

Carpenters and builders (Figure 3) were located (with one exception) east of the canal - eight of the fourteen were in Lower Town. The Nearest Neighbour value of 0.8067 showed that this group was not highly clustered. This value also did not prove significant. It may also have been a result of the small size of sample.<sup>15</sup> The carpenters and builders' location in Lower Town cannot be justified in terms of the lumber industry since most lumber operations were carried out near the Chaudière Falls. It may be a result of the age of settlement; that is, since it was an established area it controlled industry and commerce. It may also be that home addresses rather than business addresses were given in the Directory

for carpenters and builders and that this group represented a wider residential distribution.

In conclusion several observations can be made about the location of businesses in 1870. There were three main areas where occupations were located - the Chaudière Falls area, Wellington and Sparks Streets, and Lower Town. Some occupations, such as lawyers, centralized in specific blocks or areas, with very little divergence of enterprises into surrounding areas. Some others were separated into two or more nodes of activity (for example, butchers). In all cases the size of sample must be considered since a small sample (as in the cabinet-makers case) may affect the results. Of these three areas the most important are Lower Town and the Wellington-Sparks Street area. In particular, the two areas of the Wellington Ward Market and the Post Office Block are areas of specialization for butchers and lawyers respectively. It would be interesting to examine these patterns at a later date when larger more reliable samples would be available to see if these patterns possess stability or if they change in a dynamic way.

I would like to thank Elizabeth Crux for her work on the base maps which were produced for Geography 45:535, and also Stephen Palko for his work in producing the final maps. I wish to thank M.F. Fox for help in the use of his computer program on Reflexive Nearest Neighbour Analysis. Special thanks to Dr. John Clarke for invaluable assistance and advice.

L. Doreen Cross

TABLE 1  
NEAREST NEIGHBOUR ANALYSIS OF OCCUPATIONS

<i>Occupation</i>	<i>No. in Sample</i>	$R_o$	$C$
blacksmiths	16	.4445	-4.2592
carpenters and builders	14	.8067	-1.3959
cabinet-makers	7	.7409	-1.3105
shoemakers	25	.3495	-6.2497
chemists and druggists	9	.1503	-4.8764
butchers	35	.2332	-9.0366
lawyers	21	.1438	-7.8321
doctors	23	.5547	-4.3171

Sources of data - City of Ottawa Directory for 1870-71.

TABLE 2  
REFLEXIVE NEAREST NEIGHBOUR ANALYSIS OF DOCTORS

<i>Order Neighbour</i>	<i>Value of <math>R_o</math></i>	<i>Value of <math>C</math></i>
1	.523	-4.560
2	.504	-6.834
3	.517	-8.214
4	.515	-9.563
5	.543	10.107
6	.571	10.411

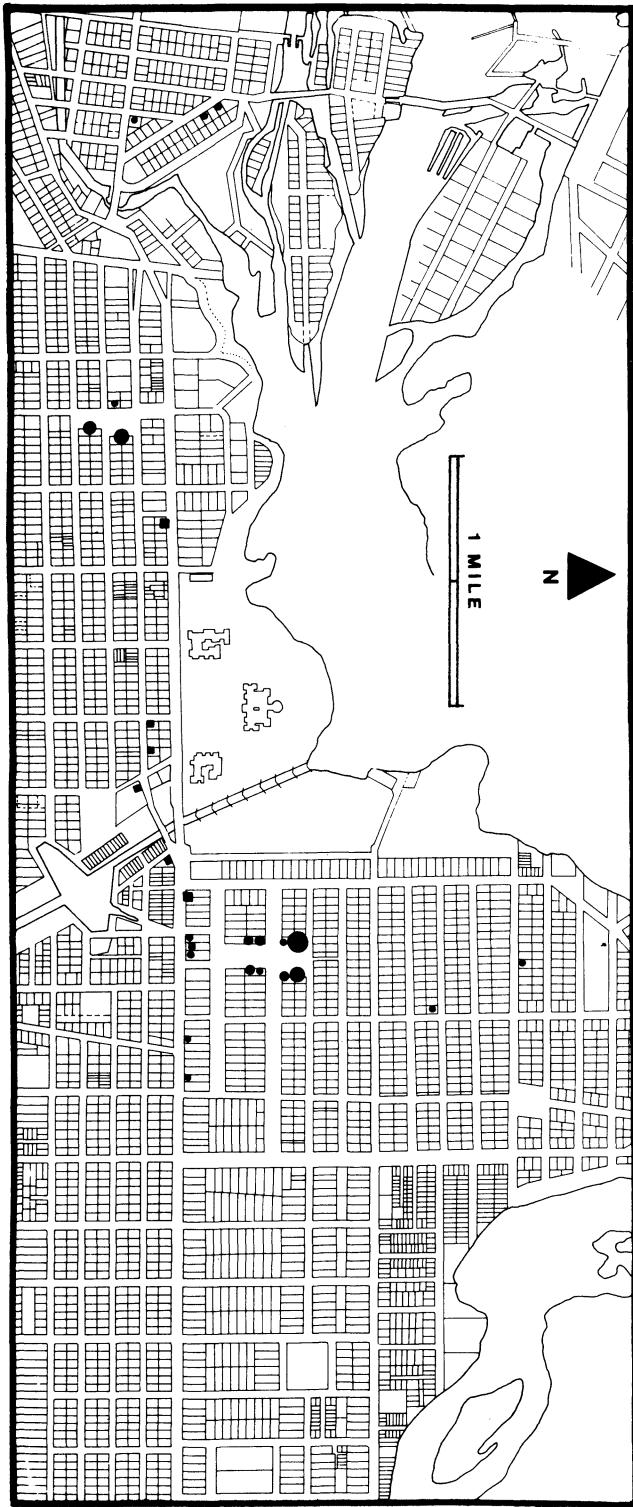


Fig.1: DISTRIBUTION OF SELECTED  
RETAIL BUSINESSES,  
OTTAWA, 1870.

- 1 ■ 2 Chemists and Druggists
- 1 ● 2 ● 3 ● 4 ● 5 Butchers

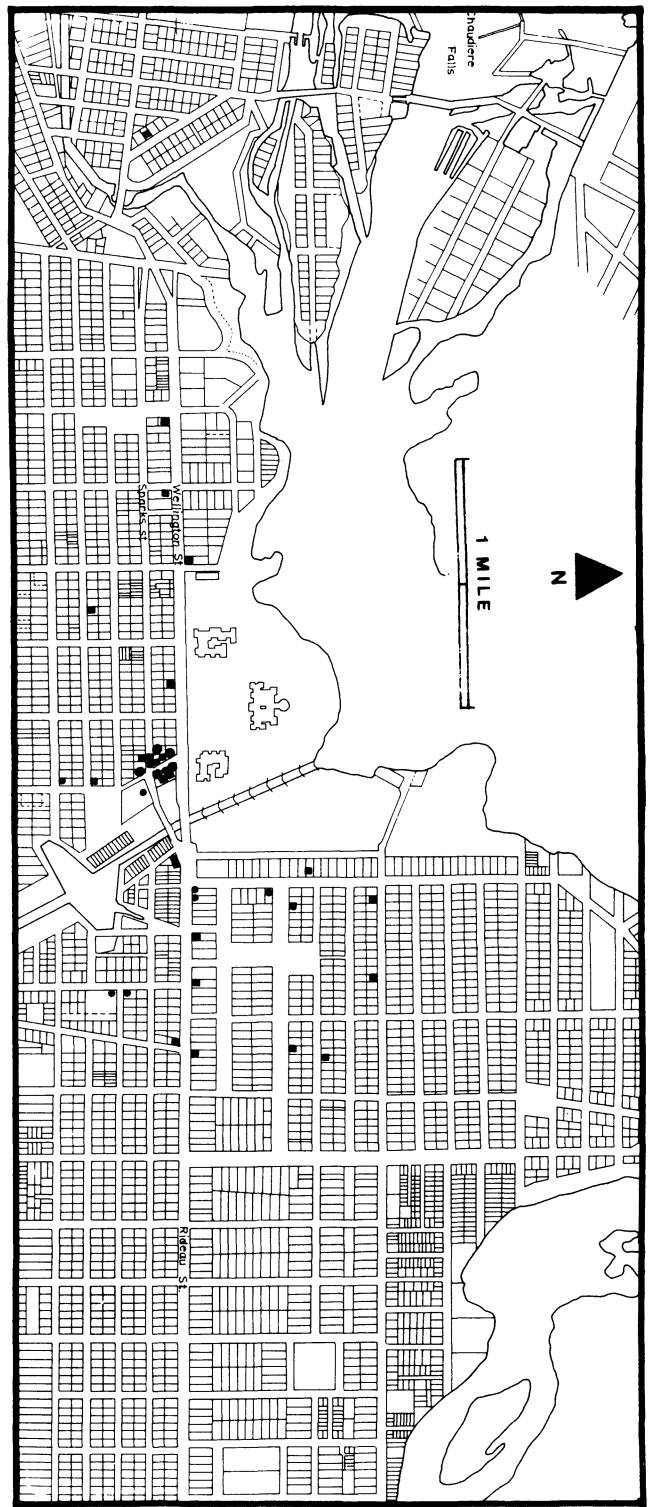


Fig.2: DISTRIBUTION OF SELECTED  
PROFESSIONAL GROUPS,  
OTTAWA, 1870.

- 1 ● 2 Lawyers
- Doctors





Fig.4: DISTRIBUTION OF SELECTED  
SKILLED OCCUPATIONS,  
OTTAWA, 1870

- Cabinet-makers
- Shoemakers

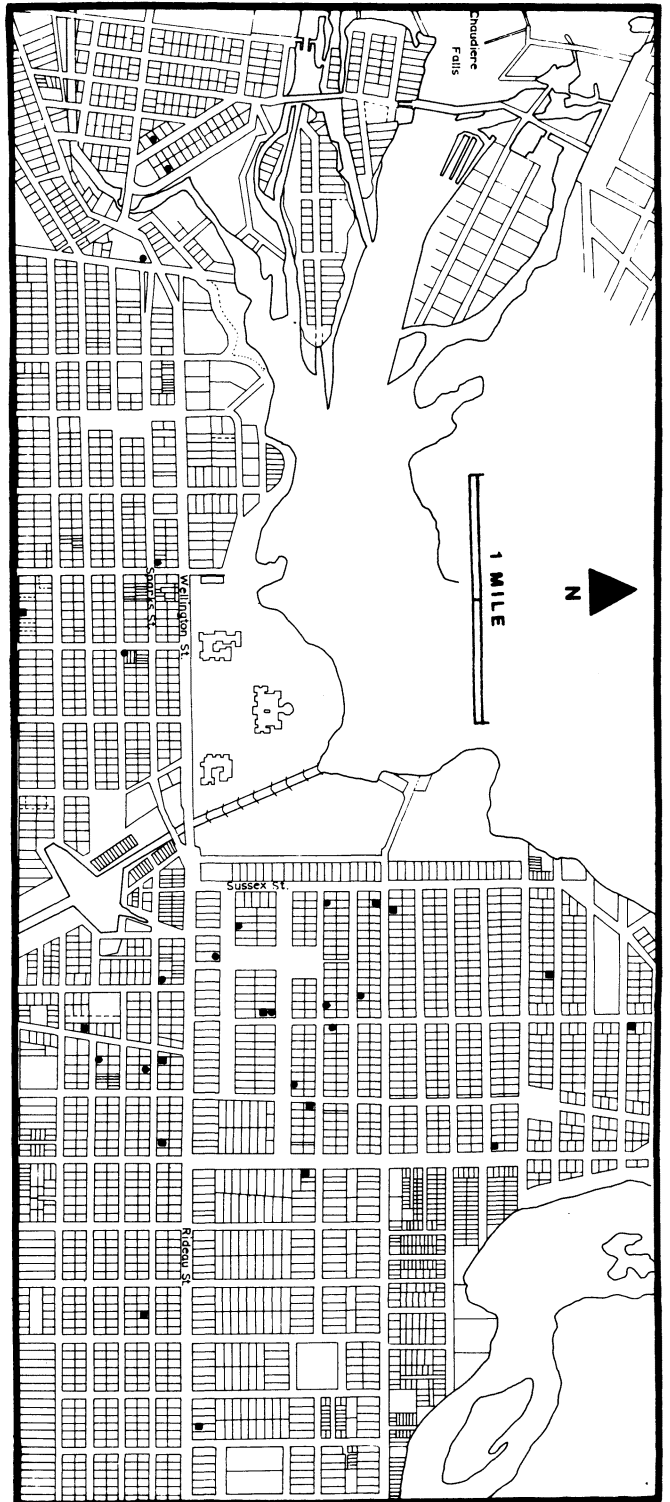


Fig.3: DISTRIBUTION OF SELECTED  
SEMI-SKILLED OCCUPATIONS,  
OTTAWA, 1870.

- Blacksmiths
- Carpenters and Builders

## FOOTNOTES

1. See D.B. Knight and J. Clarke, "Some Reflections on a Conference on the Historical Urbanization of North America", *Urban Historical Review*, No. 1, 1973, pp.10-14; and J. Lemon, "Study of the Urban Past: Approaches by Geographers", Canadian Historical Association, *Historical Papers*, 1973, pp.179-190.
2. See P. Goheen, *Victorian Toronto 1850 to 1900: Pattern and Process of Growth*, Department of Geography Research Paper, No. 127, Chicago, 1970; M. Doucet, *Nineteenth Century Residential Mobility - Some Preliminary Comments*, Discussion Paper No. 4, Department of Geography, York University, Toronto, 1972; M. Katz, "Social Structure in Hamilton, Ontario", in S. Thernstrom and R. Sennett (eds.), *Nineteenth Century Cities: Essays in the New Urban History*, New Haven, 1969.
3. *City of Ottawa Directory for 1870-71*, Hunter, Ross and Co., Ottawa, 1870.
4. P. Goheen, *op. cit.*, pp.229-230.
5. See *Insurance Plan of Ottawa City, Ontario*, Goad, Chas. E. (C.E.), Montreal, 1878. For a discussion of the material in the insurance plan, see R.J. Hayward, "Sources for Urban Historical Research: Insurance Plans and Land Use Atlases", *Urban Historical Review*, No. 1-73, May, 1973.
6. -----, *Illustrated Historical Atlas of the County of Carleton, Ontario*, H. Belden and Company, Toronto, 1879, pp.8-9.
7. For an example of the use of visual versus statistical analysis of patterns see A.F. Burghardt, "The Location of River Towns in the Central Lowland of the United States", in *The Annals of the Association of American Geographers*, 49, 1959, pp.305-323, and M.F. Dacey, "The Spacing of River Towns", *A.A.A.G.*, March, 1960, pp.59-61.
8. P.J. Clark and F.C. Evans, "Distance to Nearest Neighbour as a Measure of Spatial Relationships in Populations", *Ecology*, Vol. 35, 1954, pp.445-453.
9. See M.F. Dacey, *op. cit.*; A. Getis, "Temporal Land-Use Pattern Analysis with the Use of Nearest Neighbour and Quadrat Methods", *A.A.A.G.*, Vol. 54, 1964, pp.391-399; M.F. Fox, *The Analysis of Office Distribution Patterns in Central Ottawa, 1940-1970*, unpublished M.A. Thesis, Carleton University, 1973; and L.D. Cross, *An Analysis of the Location of Selected Occupations in Ottawa in 1870*, unpublished B.A. Thesis, Carleton University, 1974.

10. Calculated by the formula  $R_o = 2 D) \overline{(N/A)}$
11. P.J. Clark and F.C. Evans, *op. cit.*, p.446.
12. *Ibid.*, p.448, defined as  $C = \frac{\bar{r}_A - \bar{r}_E}{\bar{r}_E}$
13. *Ibid.*, p.447.
14. The Reflexive Nearest Neighbour Program is found in M.F. Fox, *op. cit.*
15. The failure of the C statistic to produce a satisfactory level of confidence for carpenters and builders and also for cabinet-makers may have been the result of the small size of sample. However, the reader will note that despite the small size of sample of the chemists and druggists, the value of  $R_o$  did prove to be significant.