CEIRM Attachment 5 to EB-2007-0673 Consultation

December 15, 2008

Two academic articles on the great clay belt of northern Ontario.

George L. McDermott, “Frontiers of Settlement in the Great Clay Belt, Ontario and Quebec”, *Annals of American Association of Geographers* (1961), pp. 261-273.

Jon Kent, “Agriculture in the Clay Belt of Northern Ontario,” *Canadian Geographer* 10:2 (1966), pp. 117-126.

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FRONTIERS OF SETTLEMENT IN THE GREAT CLAY BELT, ONTARIO AND QUEBEC[1]

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THE westward advance of the American frontier had ended by 1890, but the Canadian frontier of agricultural settlement continued to move westward and northward. At the beginning of the second quarter of the twentieth century, only two large areas of potentially arable land in Canada remained open for settlement. These two areas, the Peace River Country of western Alberta and the Great Clay Belt of northeastern Ontario and northwestern Quebec, are enclaves beyond the zone of continuous agricultural settlement. The Great Clay Belt is of special interest to the geographer, for it is shared by two provinces, with differences in cultural environment, religion, and philosophy of colonization that have resulted in strong contrasts in population numbers and distribution, method of settlement, and rate of settlement growth.

Many of the pioneer settlement studies initiated or inspired by Isaiah Bowman were concerned with the economy of the fringe settlements, hence the term "pioneer" was used. The term "frontier" seems more appropriate in this study, for it refers to the area or zone between the settled and unsettled or used and unused land.[2] It is in this context that the term frontier is used here.

In his preface to *The Pioneer Fringe*, Bowman states that "settlement habitually advances and retreats on the outer fringe of land occupation."[3] Since Bowman's writing, Stone has been the only geographer to refer to advancing and retreating frontiers of settlement, which he has shown cartographically for Anglo-America.[4] This paper is concerned with the simultaneous advance and retreat of the agricultural frontier in the physically homogeneous Great Clay Belt.

The Great Clay Belt lies almost entirely within two counties: Cochrane, Ontario, and Abitibi, Quebec (Fig. 1). The gray clay, which was laid down in a temporary glacial lake, is estimated to cover sixteen million acres in northern Ontario and thirteen million acres in northern Quebec.[5] However, only 3 percent of this total is improved farm land. Even within

FIG. 1. Location of the Clay Belt. The Great and Little Clay Belts are the largest clay pockets on the Canadian Shield. Because the frontiers of the Little Clay Belt have become stabilized, it is not included in this study.

[1] This study was supported in part by a grant from the Danforth Foundation. Grateful acknowledgment is given to Professors Kirk H. Stone and Andrew H. Clark of the University of Wisconsin for their suggestions.

[2] Kirk H. Stone, "Human Geographic Research in the North American Northern Lands," *Arctic Research*, Special Publication No. 2 of the Arctic Institute of North America, 1956, p. 218.

[3] Isaiah Bowman (ed.), *The Pioneer Fringe* (New York: American Geographical Society, 1931), p. v.

[4] Stone, *op. cit.*, p. 210.

[5] A. Gosselin and G. P. Boucher, *Settlement Problems in Northwestern Quebec and Northeastern Ontario*, Publication No. 758, Dominion of Canada Department of Agriculture, 1944, p. 8.

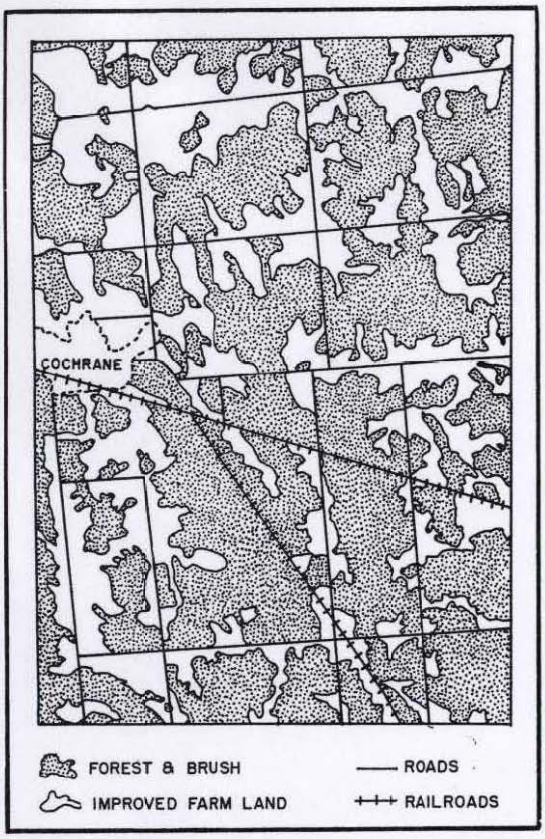

FIG. 2. Land use in the Cochrane area, *circa* 1955. Scale approximately 1:120,000. (Redrawn from Royal Canadian Airforce Photograph.)

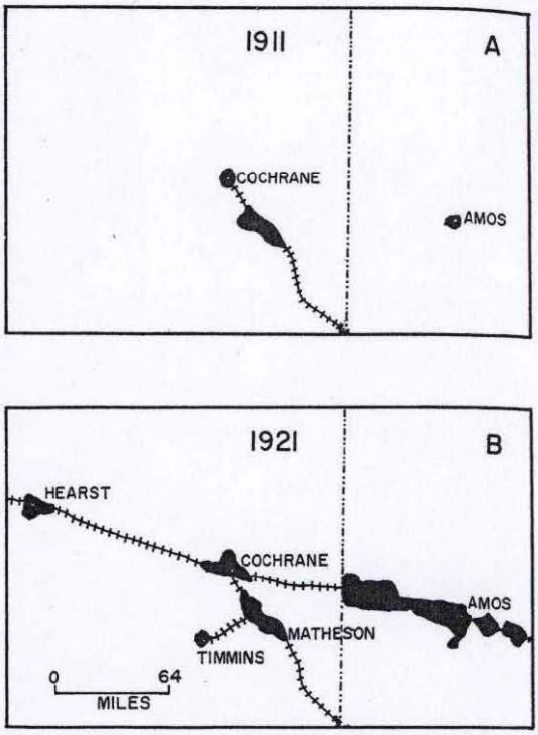

FIG. 3. The spread of settlement in the Great Clay Belt, 1911–1921. (Source: *Census of Canada, Population.*)

one of the oldest and most thickly settled rural areas near the village of Cochrane, forest and brush occupy two-thirds of the land (Fig. 2).

POPULATION AND SETTLEMENT

The first agricultural settlements in the Great Clay Belt formed a ribbon-like pattern along the Timiskaming and Northern Ontario Railroad beginning south of Matheson and extending northward toward the village of Cochrane (Fig. 3A). Even before the railroad was completed to Cochrane, settlers had begun to establish farms in the area,[6] and at least a year before the Canadian National Railroad reached the site of Amos, settlers had begun making clearings in its vicinity[7] (Fig. 3A).

When the Canadian National Railroad was completed across the Clay Belt in 1913, settlement spread discontinuously along it from the village of Cochrane to Hearst (Fig. 3B). In Abitibi, settlement spread along the railroad from a nucleus at Amos to the present eastern and western limits of settlement in less than ten years (Figs. 3A, 3B, and 4B). Even from the beginning, the area of settlement has been more compact in Abitibi than in Cochrane By 1931, the areas of settlement in Cochrane had reached their present proportions, except for some rather small areas of retreat along the peripheries. The unoccupied land adjacent to the railroads in Cochrane is either a timber concession of a large paper company and therefore not open to settlement, such as the area between the village of Cochrane and the Quebec border, or the land is physically unfit for settlement, as is the case between Matheson and Timmins. By 1931, settlement in Abitibi had spread several miles deep along either side of the railroad from the Ontario border to Senneterre, the present eastern margin of agricultural settlement. The several finger-like northward and southward projections from the main

[6] A. Marwick, *Northland Post* (Oshawa, Ontario, The Maracle Printing Company, 1950), p. 129.

[7] G. R. Ouellet, *L' Abitibi* (Quebec: Ministère de la Colonisation, 1952), pp. 31 and 59.

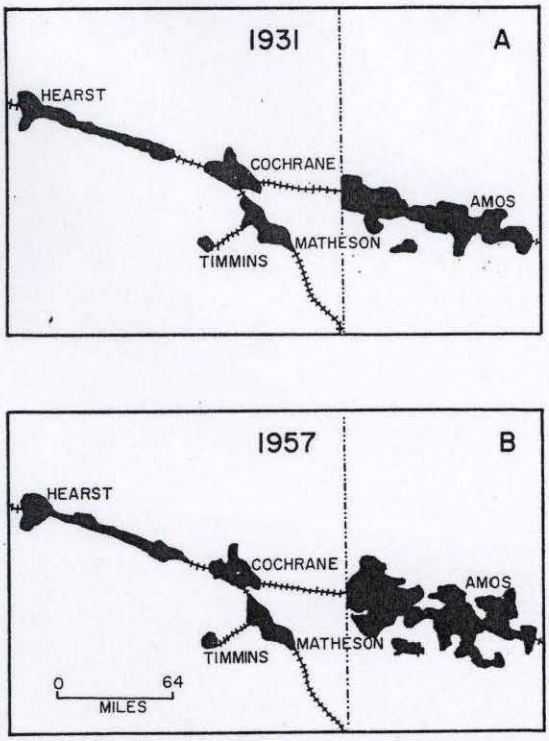

FIG. 4. The Spread of Settlement in the Great Clay Belt, 1931–1957. (Sources: *Census of Canada, Population*; and field observations.)

axis of settlement became enlarged by the establishment of twenty-eight new parishes in the quarter-century following 1931 (Fig. 4B).

The railroads have set the major axis of the settlement pattern, but the types of land survey have determined its detailed alignments. The differences inherent in the three types of survey used in the Great Clay Belt account for the details of the pattern of rural population distribution and, in part, for the local density (Fig. 5). In the southern part of Cochrane County, the townships are six miles square and consist of thirty-six one-square-mile sections. Each section is surveyed into four parcels of approximately one hundred and sixty acres each. In the northern part of Cochrane County, including the area of settlement from the village of Cochrane to Hearst, the townships are nine miles square. This system of survey has contributed to the wider dispersion of rural population, for neighboring farms are seldom closer than one-quarter mile and frequently as much as four miles of forest, swamp or brush separates adjacent farms. Widespread farm

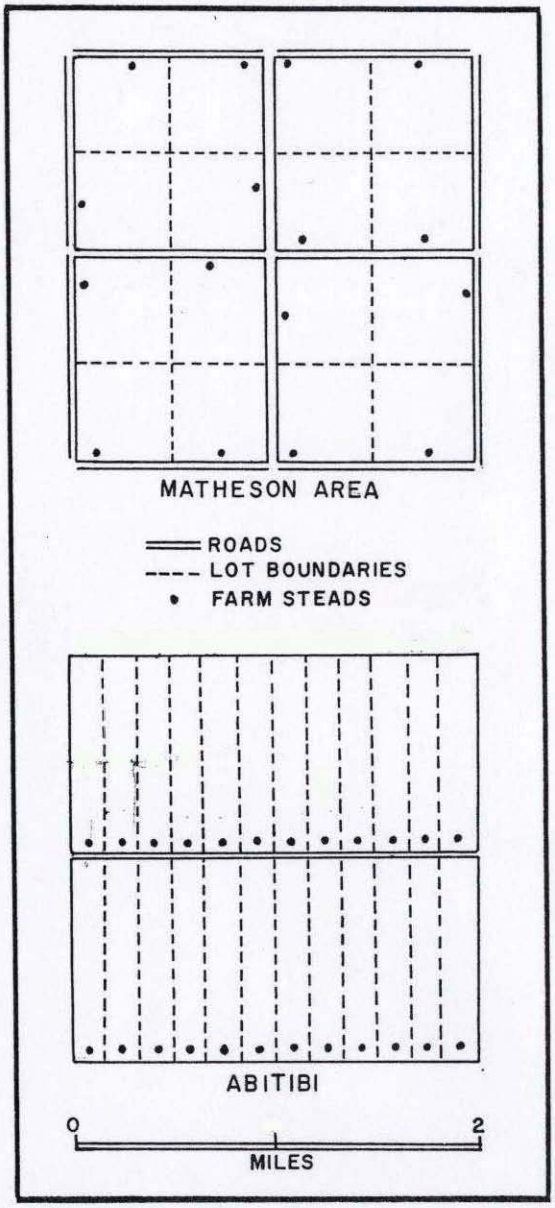

FIG. 5. Influence of different survey systems on patterns of rural settlement.

abandonment has led to even wider dispersion of rural population in Cochrane County.

The land survey system used in Abitibi has laid the framework for a pattern of rural population distribution that contrasts sharply with that of Cochrane. The ten-mile-square townships are surveyed into ranges one mile wide that extend east–west at two-mile intervals and the individual farm lots are one mile deep north–south with approximately 880 feet front-

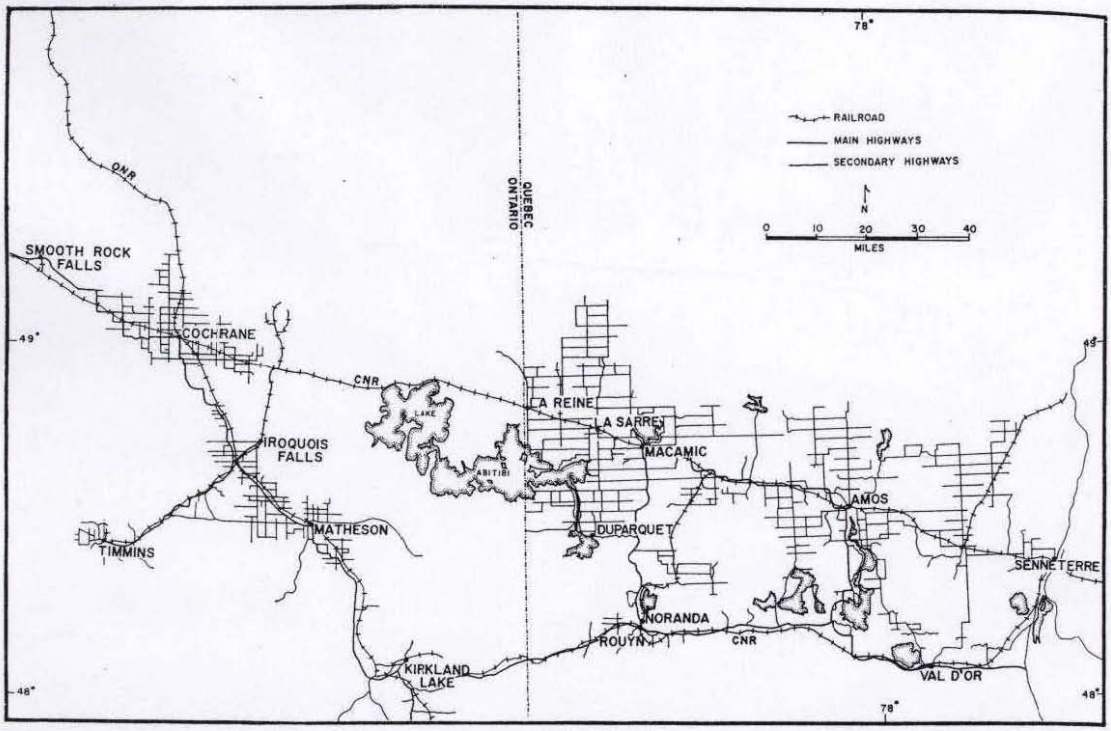

FIG. 6. Transportation network and major agglomerated settlements in part of the Great Clay Belt. The towns of Timmins, Kirkland Lake, Rouyn-Noranda, Duparquet, and Val d'Or, whose combined population exceeds 104,000, are mining centers on the southern margin of, or peripheral to, the Clay Belt. Pulpmills are located in Iroquois Falls, Smooth Rock Falls, and Kapuskasing (see Fig. 9).

age on the road (Fig. 5). Farm houses are so closely spaced that Randall has compared the settlement along a range road to the *strassendorf* development.[8] Although the settlement pattern is linear along any one of the east-west roads, the gross pattern is more compact and less ribbon-like than in Cochrane (Fig. 6).

Both Cochrane and Abitibi were opened for settlement about 1910, and until 1931, the farm population, the number of farms, the amount of land in farms, and the amount of improved land on farms remained about the same for each county. A quarter of a century later the contrasts between Cochrane and Abitibi in these four areas is indeed striking (Figs. 7 and 8). During this period, Abitibi's farm population more than tripled, while Cochrane's rose to a peak in 1941, then declined again to about the 1931 level (Fig. 7A). The total number of farms increased more than two and one-half times in Abitibi, but decreased by one-third in Cochrane (Fig. 8A). As the number of farms increased in Abitibi, the amount of land in farms increased proportionately, and as the number of farms declined in Cochrane, the amount of land in farms decreased over 24 percent, in contrast to an increase of 224 percent in Abitibi. Between 1951 and 1956, the amount of improved land in Cochrane declined over 8,000 acres, while during the same period Abitibi's improved land increased more than 39,000 acres (Fig. 8B).[9]

The decrease in farm population and the number of farms in Cochrane is not a cause for alarm, for such decreases have occurred over most of the United States and Canada during the last half-century. However, unlike most of Canada, the amount of land in farms in Cochrane has also decreased (Fig. 7B).[10] This is of

[8] J. R. Randall, "Settlement of the Great Clay Belt of Northern Ontario and Quebec," *Bulletin of the Geographical Society of Philadelphia*, Vol. 36 (1939), p. 58.

[9] All statistical data are from the *Census of Canada, Agriculture*, 1931, 1951, and 1956.

[10] Since 1931, Canada's farm land has increased by eleven million acres, although there has been some decrease in the Maritime Provinces and in small areas of other provinces. Since 1951, the total land in farms in Abitibi has also declined slightly.

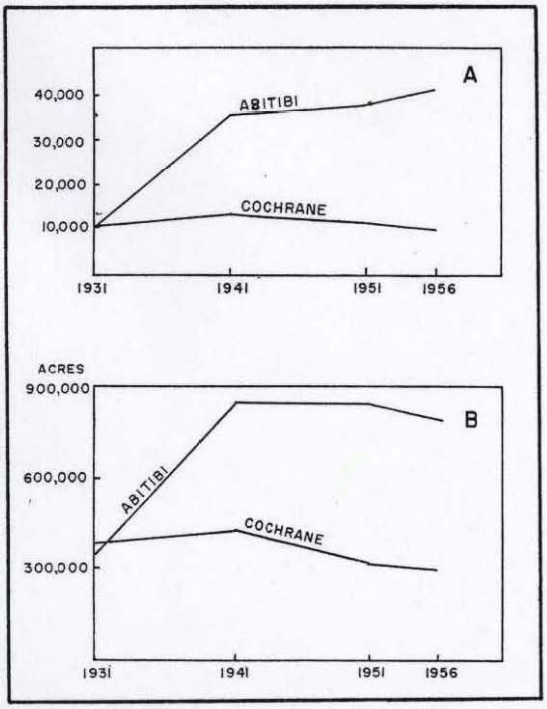

FIG. 7. A = farm population, B = land in farms. (Source: *Census of Canada, Agriculture.*)

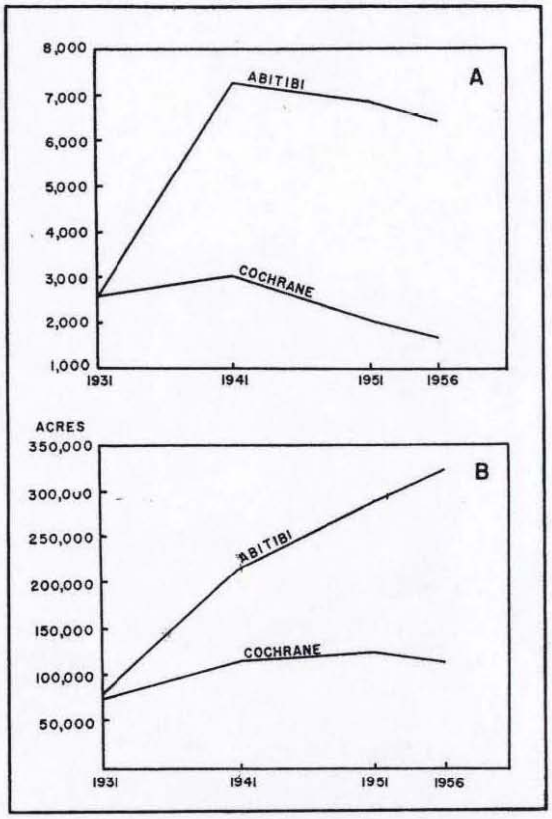

FIG. 8. A = number of farms, B = improved land on farms. (Source: *Census of Canada, Agriculture.*)

particular significance, for little of the abandoned land has been absorbed into the remaining farms, as has been the case in most other areas in Canada. Thus, in Cochrane the withdrawal of people from the frontier has resulted in the complete abandonment of farm land.

Analysis of the census statistics reveals that settlement has been advancing in Abitibi and at the same time retreating in Cochrane. The censuses, however, do not give data for units small enough to permit accurate mapping of areas of advance and retreat within each county. Extensive field work was required to determine where the frontier had advanced and retreated in the quarter-century prior to 1957.

THE RETREATING FRONTIER

The abandonment of land, ostensibly taken up for agriculture, has been one of the major problems associated with the settlement of the Ontario Clay Belt. Inasmuch as some abandonment took place very early in the history of settlement, it is necessary to distinguish between abandonment that occurred prior to and since 1931, the beginning date for this study.[11] Only those abandoned lots with standing buildings or evidences of former buildings were mapped, for on these lots the settler had made an attempt to comply with the agricultural settlement duties which required the construction of a habitable house.[12]

[11] The method used for dating abandonment was, in the absence of records, subjective. In each major area of settlement, dates of abandonment of specific properties were determined through interview, then notations were made on the size and kind of natural vegetation that had encroached upon the cleared land. Then comparison was made with the vegetation on the lot whose date of abandonment was not known. Actually most abandoned lots could be clearly classified in one category or another and very few arbitrary decisions were necessary. However, this method is subject to numerous errors, not the least of which are differential growths of vegetation due to slight differences of soil, differences in individual plants, and the condition of the land when abandoned.

[12] This distinction was made because many of the "timber pirates" lived in tents or in town while they stripped the timber from their lots.

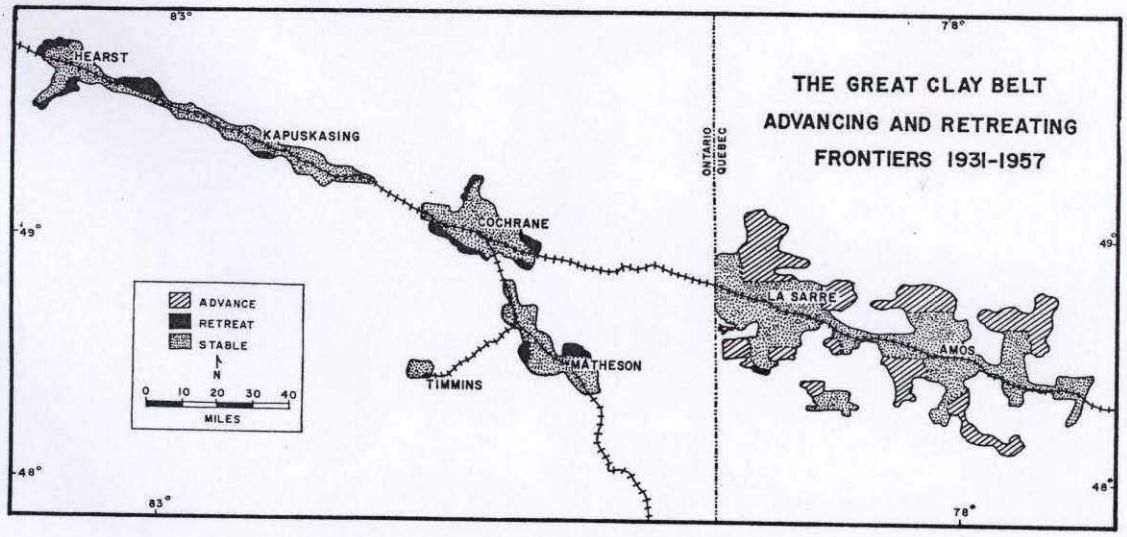

FIG. 9. Advancing and retreating frontiers of settlement, 1931–1957.

Although farm abandonment is rather widespread throughout the Great Clay Belt, it is much more concentrated in Cochrane than in Abitibi. One very striking difference in the pattern of abandonment occurs between Cochrane and Abitibi; in Abitibi the abandoned farms are scattered throughout the settled areas, and although the same is true in Cochrane, there is a marked concentration of abandonment at the ends of the roads and along the peripheral roads in the nodes of settlement, such as around the villages of Cochrane and Matheson. In Cochrane many abandoned farms are several hundred yards removed from the nearest road, but in Abitibi the abandonment is adjacent to the roads, for the settlers were permitted to buy land only along existing roads.[13]

In spite of government inducements to the French-Canadians to settle in Abitibi, about two-thirds of the rural population in Cochrane County is French.[14] Comparison of the number of French and English householders served by thirty-four rural post offices in Cochrane County for the years 1931 and 1956 reveals that English Canadians account for over 70 percent of the total decline.[15] Inasmuch as the post offices serving the villages, pulp mill towns and the mining settlements were excluded from this comparison, it can be safely asserted that the English and other non-French-Canadians have accounted for the greatest proportion of the farm abandonments.

There are relatively few areas of settlement in Cochrane larger than two square miles where some abandonment has not occurred since 1931. Only three areas are outstanding for their relative lack of abandonment: (1) Montjoy Township northwest of Timmins, (2) the area immediately northeast of the village of Cochrane, and (3) the area west of the Cochrane-Matheson road in the vicinity of Iroquois Falls.

A retreating frontier is defined, for the purposes of this study, as an area in which more than 60 percent of the farms are abandoned and the land is not used by neighboring farmers. Empirical evidence indicates that where 60 percent of the farms are abandoned, the whole landscape takes on a derelict, reverting-to-nature appearance and agricultural operations are minimal. In the areas of retreat, many of the occupied farms are on the brink of abandonment and the care of a garden or a cow is the extent of the settlers' agricultural endeavor.

[13] Interview with Clovis Meloncon, Chief of Pre-Settlement Survey and Parish Planning, Department of Colonization, June 25, 1957.

[14] *Number of Householders Served from Rural Post Offices and Rural Routes in the Province of Ontario* (Public Relations Division, Post Office Department, April 1956), pp. 10 and 55.

[15] *Ibid.*, and personal communication with W. M. Griffiths, Director of Comptroller's Branch of Post Office Department, on the 1931 data.

Eleven areas have a sufficiently high percentage of abandonment to be classed as a retreating frontier. In Cochrane, they are: (1) northeast of Matheson, 75 percent, (2) west of Matheson, 62 percent, (3) southeast of Cochrane, 80 percent, (4) east of Cochrane, 70 percent, (5) northwest of Cochrane, 66 percent, (6) southwest of Cochrane, 63 percent, (7) south of Kapuskasing, 81 percent, (8) east of Hearst, 91 percent, (9) northwest of Hearst, 80 percent, and (10) south of Hearst, 67 percent. Only one area of concentrated abandonment was found in Abitibi, a rather small area on the southern fringe of settlement twenty miles south of La Sarre, 77 percent (Fig. 9). Actually, overall land abandonment is somewhat higher than these figures indicate for they are for the period since 1931 and some land abandonment took place before that date.

The overall distribution of retreat forms a spotty pattern peripheral to existing settlement and removed from the main east-west highway and railroad. On Figure 9, the areas of settlement are outlined and those that have shown no appreciable change during the period 1931–1957 are designated as "stable."

The retreating frontier displays certain observable characteristics, the combination of which aid in its identification in the field. The recently abandoned fields, guarded only by broken fences, are choked with weeds, the first echelon of the more formidable army of alder and willow, birch and poplar that will soon follow. Abandoned houses and barns in varying stages of decadence are a common sight on the retreating frontier. Many of the buildings, particularly those with glass windows, have become the prey of vandals and thus have aged prematurely. Some settlers have even left machinery standing in the fields where it was last used. A log or clapboard barn falling down around a rusting hayrake is an ephemeral monument to man's attempt, and failure, to cope with the numerous problems that beset the settler on the Clay Belt Frontier.

As man withdrew from the frontier the institutions and commercial establishments that served him also were abandoned. Unoccupied schools and churches and closed country stores are common on the retreating frontier. Although these cultural features have been slowly vanishing from the rural scene in Anglo-America since the automobile became common, in the Clay Belt their abandonment is almost exclusively confined to the zones of retreat.

The roads on the retreating frontier show few signs of use. Double-lane, graded gravel roads that are common throughout most of the Clay Belt, give way to single lane, ungraded, and often dirt-surfaced roads on the retreating frontier. Some township roads are so overgrown with grass that even the wheel tracks have been obliterated.

Also characteristic of the retreating frontier is the absence of new clearings, good pasture, and cattle on the occupied farms. Many of the occupied farms on the retreating frontier appear to be on the brink of abandonment. Those settlers who remain derive very little of their income from farming, but work at jobs elsewhere while continuing to live on their farm lot.[16] Scattered here and there on the retreating frontier are a few settlers earnestly trying to succeed at farming. However, these settlers are quite discouraged, for the value of their land declines more rapidly with each abandonment in the neighborhood than it can be increased by improvements brought about by hard labor and investment. Abandonment breeds abandonment.

In the areas where more than half of the farms are still occupied, those areas designated as the stable frontier, settlement seems to be on firmer ground (Fig. 9). On the stable frontier, most of the farms have cattle, the pastures are relatively free from brush, the fences are in good repair, some new but small clearings are observed on the back lots, and the roads are well traveled. Here, man appears to have a certain measure of control over the physical environment, whereas on the retreating frontier man's works are slowly being obliterated by nature.

THE ADVANCING FRONTIER

The advance of the frontier has received more attention in the literature than the retreating frontier, perhaps because it is more common. Certainly it is more pleasant to report on man's achievements than his defeats. In *Pio-*

[16] The major sources of farm income in the Great Clay Belt are the sale of (1) dairy products, (2) cattle, and (3) hay, in the order listed. For a detailed discussion of agriculture in the Clay Belt see John R. Randall, "Agriculture in the Great Clay Belt of Canada," *Scottish Geographical Magazine*, Vol. 56 (1940), pp. 12–28.

neer Settlement, twenty-six authors discussed the problems attendant upon the advance of settlement in seventeen of the world's major frontier areas.[17] In few, if any, of these regions have the principles of scientific settlement advocated by Bowman,[18] been so vigorously applied as in the Quebec portion of the Great Clay Belt, where the frontier has advanced with remarkable rapidity during the last quarter of a century.

An advancing frontier is defined, for the purposes of this study, as an area in which the farms have been established since 1931, and in which more than 60 percent of the total number of farms is occupied. Data on the dates of establishment were obtained from old maps, interviews, Annual Reports of the Ontario Department of Lands and Forests, the Quebec Ministry of Colonization, and from parish histories.

The gross distributional pattern of advance, as well as retreat is clearly divided along provincial boundaries (Fig. 9). All the areas of advancing frontier are in Abitibi and are larger in extent than the areas of the retreating frontier in Cochrane. This is congruent with the census data which indicate great growth in Abitibi and modest decline in Cochrane (Figs. 7 and 8).

In detail, the distribution of areas of advance is peripheral to the older established areas of settlement. Inasmuch as the land adjacent to the railroad and main east-west highway was settled quite early, the advancing frontier is several miles, in some places more than thirty miles, removed from the main axis of settlement. The advance of the frontier has taken the form of broad, finger-like projections into the forest both northward and southward from the railroad. Some of these areas, particularly those southwest, south, southeast, and northeast of La Sarre, are individual parishes, while each of the other areas of advance consists of three to six contiguous parishes.

Although small, ephemeral advances of the frontier were made in Cochrane—especially west of Matheson, southwest of the village of Cochrane, and south of Hearst—by the Relief Land Settlers during the early 1930's, nearly complete abandonment of these areas has subsequently occurred. Thus, no area larger than a few widely scattered individual farms has advanced the frontier in Cochrane during the last quarter of a century. Not only did the frontier in Cochrane fail to advance during this period, but it also failed to maintain the limits once established.

The advancing frontier may be identified in the field by the combination of several observable characteristics. The most striking features are the new, small clearings flanked by forest on one, two, or three sides. The land, newly exposed to sunlight, is covered with a reddish brown peat which has a raw, cold appearance, and when plowed becomes mottled as the peat and gray clay are interwoven.

In Abitibi, the newness and style of the homes and farm buildings are indicative of the advancing frontier. In the four parishes established since the Second World War, the houses are characteristically square, one and a half stories high and covered with red or blue asphalt shingle siding. These houses were built according to specifications of the Quebec Ministry of Colonization and are identical in every outward detail. Houses built prior to the Second World War are quite varied in style, although some form of the two-story type prevails. There is an obvious lack of such refinements as surfaced driveways, sidewalks, lawns, flowers, and general landscaping around the houses.

Because the Province of Quebec has given substantial financial aid to each new parish for the construction of a central school and parish church, these buildings are more permanent and more attractive than those commonly found on the advancing frontier in the Prairie Provinces.[19] The amount of landscaping is frequently the only observable difference in the exterior appearance of the churches and schools in the stable areas and on the advancing frontiers.

Three mechanical symbols of the advancing frontier have recently appeared in Abitibi: (1) the bulldozer which is used to remove tree

[17] W. L. G. Joerg (ed.), *Pioneer Settlement* (New York: American Geographical Society, Special Publication No. 14, 1932).

[18] Bowman, *op. cit.*

[19] C. A. Dawson, *Settlement of The Peace River Country*, Vol. 9 of *Canadian Frontiers of Settlement*, (Toronto: Macmillan, 1934), p. 9. For a more recent discussion see Burke G. Vanderhill, "Observations in the Pioneer Fringe of Western Canada," *Journal of Geography*, Vol. 57 (1958), pp. 431–441.

stumps after the merchantable timber has been cut, (2) the giant plow, pulled by a twenty-four-ton caterpillar-type tractor, which penetrates the soil to a depth of three feet or more, and (3) the power shovel which is used to excavate deep ditches to drain marshy land. These three government-owned implements have done much to hasten the process of establishing farms, and in many instances have rendered fit for cultivation land that was too poorly drained or too thickly covered with peat to be utilized under previous land-breaking techniques.

Great mounds of brush and peat in the fields are no longer symbolic of the advancing frontier in Abitibi, for the use of deep plows permits the turning under of small saplings and branches, up to four inches in diameter, and several inches of peat, thus obviating the necessity of piling peat and stacking brush to be burned. As a result, the incidence of forest fires in Abitibi is much less than in Cochrane where brush burning is still common.[20]

The roadsides in front of the newly established settler's homes give testimony of the changing landscape, for they are lined on either side with shoulder-high stacks of pulpwood logs. Yet, despite the settler's valiant efforts to make farms from forests, the process is a slow one; the clearings will remain small (Fig. 2) and logs will line the roadsides for many years. Forest dominates the landscape on both the retreating and advancing frontiers. On the retreating frontier, fields are giving way to brush and forest, while on the advancing frontier the forest is giving way to fields.

CAUSES OF RETREAT

A large number of the people who attempted to settle in the Ontario Clay Belt had neither experience in or familiarity with forestry or agriculture. The settlers' unfamiliarity with the conditions of the Clay Belt as well as the techniques of their newly adopted means of livelihood caused discouragement and ultimate abandonment. For example, the settlers who were sent to Cochrane County under the Relief Land Settlement Plan in 1932 and 1933 were skilled and semi-skilled tradesmen from southern Ontario cities.[21] In the Kapuskasing and Hearst area 70 percent of the relief settlers had abandoned their lots within seven years.[22] By 1957, eight of the original 124 relief settlers in the Matheson area remained on the land, but only two were attempting to farm.[23] The zone of retreat west of Matheson was formerly occupied by these relief settlers (Fig. 9). Only two of the original 93 relief settlers who took up lots southwest of the village of Cochrane remained in 1957.[24] The 105 relief settlers in the Kapuskasing-Hearst area had also dwindled to only two by 1957.[25] These settlers originally occupied the area of retreat south of Kapuskasing and south of Hearst (Fig. 9).

Frontier settlement in the mid-twentieth century is more subject to human failure than a century ago, for the gap between life on the frontier and life in urban communities or well-established farming districts is far greater than at any time in the past. Careful screening of the settlers would help to reduce suffering and the misuse of land due to the presence of misfits on the frontier. Settler-screening programs have been employed in Quebec[26] and Argentina[27] for several years, and officials express general satisfaction with the criteria used, which include the following: the prospective settlers must have (1) experience in or aptitude for farming, (2) enough capital or equipment to begin modest farming operations (in Quebec, the government gives this kind of aid to the settler), and (3) a good reputation and be in good health. It would be to the advantage of the settler and the government alike if only those persons who have the greatest possibilities for success were permitted to purchase a lot on the frontier.

In order for an Ontario settler to obtain a let-

[20] Quimby Hess, "Land Use Planning and Resources Development in the Northern Region," Progress Report No. 1, mimeographed, Cochrane, Ontario, March 20, 1956, p. 30.

[21] *Report of the Minister of Lands and Forests*, Province of Ontario, 1941, p. 12.

[22] *Report of the Minister of Lands and Forests*, Province of Ontario, 1940, p. 11.

[23] Interview with L. H. Hanlan, Agricultural Representative, Matheson, July 19, 1957.

[24] Interview with Raoul Portelance, Agricultural Representative, Cochrane, July 24, 1957.

[25] Interview with T. J. Murphy, Lands Agent, Kapuskasing, July 26, 1957.

[26] Interview with Henri Fortier, Chief of the Establishment Service, Department of Colonization, Quebec, August 8, 1957.

[27] Carl C. Taylor, *Rural Life in Argentina* (Baton Rouge: Louisiana State University Press, 1948), pp. 354–355.

ter of patent or title to his land he must build a house of 320 square feet and reside in it for six months of every year; and clear and cultivate a minimum of two acres of land each year until fifteen acres are under cultivation.[28] These settlement duties, however, have not been rigidly enforced, with the result that many settlers removed the timber from their land but made little or no effort to farm.

None of the land in the Ontario Clay Belt had been surveyed prior to settlement to determine its agricultural capability.[29] The settler, after selecting a lot, is required to inspect it thoroughly and signify that the lot is 50 percent cultivable.[30] The large number of poorly drained lots taken up for farming and then abandoned, gives cause to wonder if the settler even inspected the land before the purchase was made. Binns considers a land-use capability survey an essential preliminary step to settlement.[31]

The major factor affecting the retreat of the frontier is the low financial return from the "bush farm" in comparison with other occupations. Of the scores of settlers, ex-settlers, and officials interviewed, each listed low farm income in proportion to labor expended as the principal cause of farm abandonment in both Cochrane and Abitibi. The estimated average farm income for Cochrane County in 1955 was $1,160, which was only one-third the average farm income for the Province of Ontario.[32] The median farm income in Cochrane for that year was less than $250.00. For the same year the average income of the Cochrane forestry worker was estimated to be over $4,000 or nearly four times the average farm income in the same area.[33] As the demand for newsprint has steadily risen, employment with the pulpwood companies has been extended to ten or eleven months a year, the slack period coming during the spring thaw when movement in the woods becomes difficult. During the active period, jobs usually exceed the local labor supply and in 1955, over one and a half million dollars was paid in wages to Quebec residents for working in the forests and mills of Cochrane County.[34]

A large number of settlers have given up serious attempts to farm, but still remain on the land. These settlers have at one time cleared and cultivated enough land, about fifteen acres, to obtain a patent, but now keep only a cow or two and cultivate a garden, and although they are essentially non-agricultural workers their land is classed as a farm.[35] In Cochrane County, 70 percent of the farms are classed as part-time and small scale farms with an annual farm income of less than $250.00.[36] Thus, the majority of the farmers obtain most of their income from work off the farm.

Mining as well as forestry has attracted settlers from their farms in at least two areas of the Clay Belt. Some of the settlers in the zone of retreat northeast of Matheson have gained employment in the asbestos mine eleven miles east of Matheson. The only area of retreat in Abitibi lies twenty miles south of La Sarre on the southern edge of the developed area and one mile north of the gold mines at Duparquet (Figs. 6 and 9). Here, as at Matheson, farms with considerable improved acreage have been forsaken for higher paying jobs in the mines.[37] The mines in this case have served as a magnet, not drawing farm produce from the local area as Innis suggests,[38] but rather drawing the farmer himself. Inasmuch as only three areas of agricultural settlement adjacent to mining centers were studied—the two mentioned and

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[28] *Lands for Settlement*, Ontario Department of Lands and Forests, n. d., pp. 3–4.

[29] In 1960, the Ontario Department of Lands and Forests published *The Glackmeyer Report of Multiple Land-Use Planning*, which includes a detailed map of agricultural use capability of the settled area north of the village of Cochrane.

[30] *Ibid.*, p. 3.

[31] Sir Bernard O. Binns, *Land Settlement for Agriculture* (Rome: Food and Agricultural Organization of the United Nations, Development Paper No. 9, 1951), p. 3.

[32] *Economic Survey of Ontario*, Office of Provincial Economist and Bureau of Statistics and Research, Treasury Department, Province of Ontario, 1955, p. C-6.

[33] Interview with Quimby Hess, Regional Forester, Cochrane, June 18, 1955.

[34] Quimby Hess, "Progress Report No. 1," Land Use Planning and Resources Development Committee, Cochrane, March 20, 1956, p. 46.

[35] A farm is considered as any holding of three acres on which agricultural operations are carried out.

[36] *Census of Canada, Agriculture*, 1951.

[37] Interviews with André Chabot, Chief of Settler Establishment Service at La Sarre, July 12, 1957 and Gaston Lavoie, Deputy Chief of Colonization at Rouyn, July 10, 1957.

[38] Harold A. Innis, *Settlement and the Mining Frontier*, Vol. VII of *Canadian Frontiers of Settlement* (Toronto: Macmillan, 1936), p. 373.

the area near Timmins—it is difficult to draw conclusions concerning the effect of the mines on farm abandonment. However, it is significant that only the Timmins area has little abandonment while the other two areas are classed as parts of the retreating frontier. More research needs to be conducted in the Canadian Shield to test the theory that mining stabilizes agriculture.

Providing for the basic necessities of life is the fundamental problem facing the new settler during the first few years on the frontier. The gap between the economic return of the bush farm and the wages offered by other occupations is basic in explaining why three-fourths of the settlers in both Cochrane and Abitibi have found it necessary to couple farming with forestry or some other occupation, and why so many have given up farming entirely. The present part-time farming-forestry occupance of the Great Clay Belt is viewed by Ontario officials as a temporary, yet essential, phase in the sequence of occupation leading to full-time farming. Quebec officials, on the other hand, view part-time forestry as a short circuit en route to full-time farming, and an attempt is being made by financial grants and numerous services to shorten the period of dependence on part-time employment off the farm. However, it would appear that part-time farming is the final stage for many, if not most, of the present generation of settlers in both Cochrane and Abitibi.

CAUSE OF ADVANCE

For years the Province of Quebec has been faced with the problem of a rapidly growing population on a limited agricultural land base. This is particularly serious in Quebec, where both the church and state subscribe to the philosophy that large numbers of people should live on the land, and especially that those raised on farms should be encouraged to go into farming on their own. Only small parcels of land suitable for agriculture remain unoccupied in Old Quebec; and for a half-century or more fathers have had difficulty in establishing their sons on farms. As a result there has been a drift of people to the cities or to the United States. In an attempt to stem this flow, the Province of Quebec launched a colonization program in 1923[39] that has become more elaborate and generous with each passing year.

The Quebec Department of Colonization is dedicated to the task of assisting the settler in becoming established on the frontier. The government assistance is manifest in many forms, but may be discussed under three broad headings: (1) pre-settlement planning, (2) financial assistance, and (3) technical assistance.

Pre-settlement Planning

Each new Abitibi parish is carefully surveyed, mapped, and planned before the settlers arrive. Soil surveys are made lot by lot to determine the capability of the land for agriculture, and land that needs extensive improvement will be temporarily withheld from settlement and land unfit for agriculture will remain in forest.[40] Upon completion of the land capability maps, the location of roads, farm lots, houses, and the parish center is planned. The latter are centrally located and usually consist of a church, a presbytère, a general store, an elementary school, and a few houses. Compactness of settlement is desired by the Department of Colonization and this is fostered by the long lot survey (Fig. 5), and the department policy that settlers should be no more than five miles from the parish center and that every physically suitable lot should be occupied.[41]

Abitibi is perpared for a future advance of the frontier, for twenty-seven projected parishes, mostly north of the present area of settlement, have been surveyed, mapped, and planned.[42] These parishes will not be opened for settlement until all the suitable vacant lots in the older parishes have been filled, unless a large group of people wish to settle as a unit.

The settlement duties in Quebec are more demanding than those in Ontario. In order to obtain a letter of patent, the Abitibi settler must (1) clear and cultivate a minimum of three acres of new land each year so that within ten years thirty acres or 30 percent of the

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[39] *Statistical Yearbook of the Province of Quebec*, 1924, p. 142.

[40] Personal communication from J. B. Pouliot, Chief of Land Classification, Department of Colonization, Quebec, March 15, 1957.

[41] Interview with Clovis Meloncon, Chief of Pre-Settlement Surveys and Parish Planning, Department of Colonization, June 25, 1957.

[42] Interview with Romeo Lalande, Deputy Minister of Colonization, Quebec, August 9, 1957.

lot is under cultivation, (2) build a habitable house at least twenty by twenty-four feet and occupy it until the letter of patent has been issued, and (3) build a barn thirty-four by thirty-two feet. The one hundred-acre lots sell for thirty cents an acre, payable in five equal payments, interest free, which are deductible from government grants.[43]

Financial Assistance

To encourage and assist the settler in establishing an economic farm unit of about thirty acres as rapidly as possible, the Quebec Department of Colonization has been paying statutory premiums for clearing and plowing since 1923. The first premiums were $4.00 an acre on the first five acres put into cultivation.[44] Since 1947, the settler has received $40.00 an acre for the first forty acres cleared and plowed.[45]

In addition to offering premiums for work performed, the Department of Colonization has initiated provincial, or participated in federal, settlement schemes. The Relief Land Settlement Plan of 1932–1934, a joint federal, provincial, and municipal project, previously described for Ontario, was responsible for the establishment of four parishes,[46] whose combined population was 3,650 in 1952.[47] Blanchard states that 28 percent of these settlers abandoned their land by the end of the second year,[48] yet there are very few unoccupied farms in these four parishes because the Department of Colonization makes every attempt to place another settler on the land as soon as an abandonment occurs. This policy protects the investment in the land and the buildings and takes advantage of any improvement made by earlier settlers.

The Vautrin Colonization Plan, in force during 1935 and 1936, aided the establishment of group settlements of more than fifty families by providing transportation for the head of the family, a small grant for home construction, and a small relief allowance during the first year. In addition the settler was entitled to clearing and plowing premiums of $10.00 per acre for the first twenty acres cleared and $10.00 per acre for the first ten acres plowed.[49] During the two years of its existence, the Vautrin Plan helped to establish fourteen parishes,[50] whose combined population in 1952 was over 7,200.[51]

In 1937, the Roger-Auger Colonization Plan, another joint federal, provincial, and municipal project, was inaugurated to help establish urban families on relief as settlers on the Abitibi frontier. Grants for living expenses and construction totaling over $1,200 were spread over a four-year period, at which time the federal and some municipal governments withdrew support, but Quebec kept the plan in force during the Second World War.[52] The six parishes[53] established under this plan had a combined population of over 3,600 in 1952.[54]

The present subsidy plan, adopted in 1947, is more generous and embraces more economic aspects of frontier settlement than the previous plans. Under this plan, the statutory premiums total $40.00 per acre for the first forty acres cleared and plowed, and in addition, a maximum of $1,050 is granted in credit for the purchase of livestock and farm equipment.[55] Thus, by the time forty acres are under cultivation, the settler will have received $2,650 in bonuses for working his own land for which he originally paid thirty cents an acre.

Other subsidies designed to increase the permanency of settlement include: $30.00 a month subsistence allowance for the first six months of settlement; a grant of $600.00 and a loan of an additional $600.00 for the construction of a house with the materials furnished at cost; up

[43] Romeo Lalande, "Settler Assistance, In View of Promoting Colonization Through Progressive and Rational Methods," 1956, Department of Colonization, Quebec, mimeographed, pp. 3 and 5.

[44] *Statistical Yearbook of the Province of Quebec*, 1924, p. 142.

[45] Lalande, *op. cit.*, p. 4.

[46] Ste. Gertrude de Villemontel, Laferte, Ste. Germaine de Palmarolle, and Roquemaure.

[47] G. R. Ouellet, *Un Royaume Vous Attend: L'Abitibi* (Quebec: Ministère de la Colonisation, 1952), pp. 56, 74, 81, and 82.

[48] Raoul Blanchard, "L'Abitibi-Temiscaminque," *Revue de Géographie Alpine*, Vol. 37 (1949), p. 490.

[49] *Statistical Yearbook of the Province of Quebec*, 1935, p. 165.

[50] Rapide Danseur, Destor, Preissac, La Corne, Vassan, Villebois, Beaucanton, Val St. Giles, St. Vital, Berry, St. Dominique du Rosarie, Lac Castagnier, Castagnier, and Rochebaucort.

[51] Compiled from Ouellet, *op. cit.*

[52] *Statistical Yearbook of the Province of Quebec*, 1944, p. 75.

[53] Val Paradis, Manneville, Champsneufs, Val Senneville, St. Edmond, and Ile Nepawa.

[54] Compiled from Ouellet, *op. cit.*

[55] Lalande, *op. cit.*, p. 4.

to $250.00 for well drilling; $75.00 for house and barn wiring; a $400.00 grant toward the construction of a barn; and $40.00 for planting a garden.[56] By the time the Abitibi settler, established since 1947, has 40 percent of his farm acreage under cultivation, he will have received a maximum of $4,345 in grants and subsidies from the Department of Colonization. Some of the subsidies are for work performed by the settler in establishing a farm on the frontier; others are direct grants in an effort to make settlement more permanent.

Since the inception of the present subsidy program in 1947, four parishes have been established,[57] which in 1952 had a combined population of approximately 2,100 on 370 lots.[58] By 1957, 18 percent of the lots in these parishes had been abandoned, and the process of land clearing and building construction seemed to be progressing at a slow rate. During this period the Department of Colonization has placed its greatest emphasis on settling vacant lots in existing parishes rather than creating new ones. Over 4,600 settlers were assigned partially improved lots in older parishes that had been vacated, or new lots that had recently become suitable for cultivation by the completion of a drainage or deep-plowing project.[59]

The four successive settlement plans that have been in operation continuously since 1932 have had a marked effect on the geography of Abitibi. Of the present sixty agricultural parishes in Abitibi, twenty-eight were established with the aid of one or more of these plans. The 1952 population of these newer parishes was more than 15,000 persons. None of the newer parishes has been disbanded.

Technical Assistance

In addition to pre-settlement planning and the granting of subsidies, the Department of Colonization provides the settler with a variety of technical assistance. After a settler has proved his good intentions to farm by clearing and breaking a portion of his land, he may request the assistance of the Department of Colonization's heavy machinery in further clearing and plowing. Approximately half of the cost of this operation is charged against the settler's premiums.[60] The advice and assistance of drainage engineers, foresters, agronomists, and building engineers is available on request. A settler within each parish, who has business ability and who has developed his own farm to a high degree, is employed to serve as an Inspector. His duties involve advising the settlers on clearing, planting, and other essentials to good farming, and keeping a record of the settlers' performance of the prescribed settlement duties as a basis for the payment of premiums.

The Catholic church also makes a significant contribution to settlement in Abitibi. The Department of Colonization depends primarily upon the priests of the Colonization Societies to handle publicity concerning settlement possibilities on the frontier and to secure recruits. The church parish, and not the township, is the effective unit of settlement. Each parish has a resident curé, who not only serves as a spiritual advisor but also as a financial and agricultural advisor. The strength and success of the parish is intimately related to the drive, enthusiasm, and skill of the parish priest.[61] Strong leadership is especially needed during the formative years of settlement.

SUMMARY

Although there are many factors involved in the movement of frontier in the Great Clay Belt, the role played by the respective provincial governments is of major importance. Ontario has followed a laissez faire policy toward the settler, who has employed the same trial and error methods characteristic of the frontier a century ago. Quebec has taken a more paternalistic approach to settlement by aiding the settler in every possible way through the application of rational principles to settlement planning and a willingness to spend any necessary amount of money with the result that the developed area of Abitibi has doubled in the last quarter of a century. In the final analysis, it appears that the government concerned must decide whether the advance of the frontier is desirable and whether it is willing to pay the price to achieve that goal.

[56] Lalande, *op. cit.*, pp. 2–4.

[57] St. Eugene, Languedoc, Guyenne, and Despinassy.

[58] Ouellet, *op. cit.*, pp. 45, 50, 59, and 79.

[59] Compiled from the *Rapport du Ministre de la Colonisation de la Province de Quebec*, for the years 1947 through 1956, except for 1951 and 1952 when comparable data were not reported.

[60] Interview with Al Leuzon, Chief of Colonization Works Service, La Sarre, Quebec, July 4, 1957.

[61] Interview with Romeo Lalande, Deputy Minister of Colonization, Quebec, August 9, 1957.

AGRICULTURE IN THE CLAY BELT OF NORTHERN ONTARIO

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WITHIN THE Canadian Shield, the Great Clay Belt of Northern Ontario and Quebec, covering roughly 70,000 square miles, is the largest area of potentially arable land. Although, most of this vast plain has been accessible to settlement for nearly half a century, only a few thousand acres are presently in use as agricultural land. Moreover, the present farmland is only the remnant of an earlier and larger agricultural area, much of which is no longer under cultivation and now consists mainly of abandoned farms in various stages of reforestation.

The purpose of this article is to explore the principal problems of contemporary agriculture in the Ontario Section of the Great Clay Belt (Figure 1). Usually referred to as the Cochrane Clay Belt,[1] this segment is generally considered to encompass 16,000,000 acres of which the 187,166 acres designated as farmland in the District of Cochrane according to the 1961 Census of Canada are under discussion here.[2]

PHYSICAL CHARACTER OF THE CLAY BELT

To illustrate the physical base, Figure 1, redrawn from the *Atlas of Canada*, shows roughly the area of the deposits of the Lake Barlow-Ojibway complex of late-glacial time from which the Great Clay Belt originated. It is an area in which "probably different parts were covered by the proglacial lake and subsequent smaller lakes at different periods and for different lengths of time,"[3] and in which the clays are not continuous. In depth they vary from thin layers of a few inches to maximum depths of about 250 feet. In extent the whole belt tapers towards the west—being 600 miles long and at its widest in the east about 260 miles north to south. Elevations are nowhere great, the highest reaching only 1,325 feet at the R.C.A.F. Station at Ramore, and the lowest 860 feet at Lake Abitibi. The "height of land" forming the southern boundary of the clay belt is a series of rolling rock-knobs between 1,000 and 1,500 feet in elevation, extending from Cheminis on the Quebec border to Geraldton in the west. The drainage flows through a number of large, parallel, canal-like rivers northward to James Bay but, in the interstream tracts, drainage is generally very poorly developed, especially on the broad, flat clay plains. Nowhere is there an unlimited lowland of uniform clays awaiting the farmer's attention, though some remarkably large pockets of varved clay do exist.

The whole area is underlain by crystalline rocks, frequently outcropping as knobs or ridges projecting through the glacial debris. In a few places, occasional remnants of isolated Ordovician and Silurian sediments are to be found at the surface. The other principal terrain features are glacial landforms comprising eskers, moraines, and pro-glacial lake features dating from the last stages of the Wisconsin glaciation. Thus, the surface features are varied: shattered and faulted basement rocks that

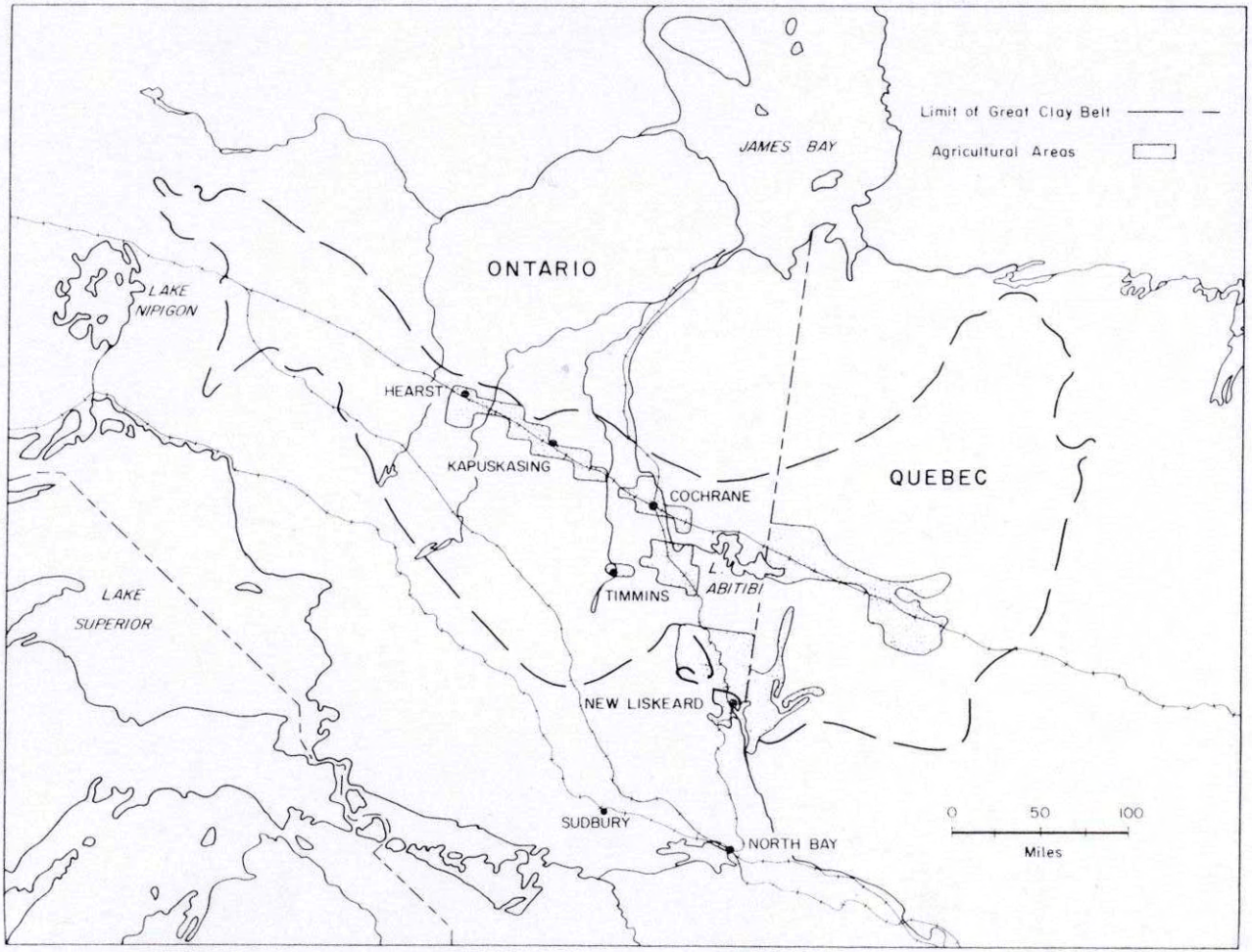

FIGURE 1. Great Clay Belt of Northern Ontario and Quebec.

form the higher elevations alternate with extensive tracts of sands and gravels, and with poorly drained, former lake floor areas of clays that usually underlie extensive recent peat accumulations.

Generally, the soils are podsols, except where the varved clays have impeded the downward leaching of organic material. Where this has occurred, the soil is richer but tends to be very acid, ill-aerated, and usually extremely sticky. Locally, sands and gravels, associated with large eskers extending north and south throughout the width of the clay belt, underlie lighter soils which invariably require supplemental nutrients for proper management and crop growth. Hills states: "Over 85 per cent of the Cochrane clay belt is imperfectly to poorly drained; peat and peat-glei soils are most common. A grey-wooded type of soil profile is found on all well-drained clay materials. Podsol profiles are common on the sands and also occur as superimposed profiles in grey-wooded soils, in which the upper layers are loamier than normal in texture."[4] The better soils for agriculture lie on sandy outwash spreads or along the well-drained banks of incised streams, though, in the latter case, they are susceptible to severe gullying.

The climate in the clay belt is classified under the Koppen system as Dfb. According to Thornthwaite, its moisture index is B_2 and its thermal efficiency index is C_2^1.

L. J. Chapman has summarized the climate as follows:

> Northern Ontario, lying between the Upper Great Lakes and Hudson Bay, has a modified continental climate. Since the longest weather records in the province show only a small rise in average temperatures during the last century the present normals may be expected to approximate the climate of the future. In summer (July) the settled sections have temperatures of 61° to 67°F. In January the isotherm of 0°F. runs through the northern clay belts. In the spring the curve of average temperatures reaches 42°F. about April 24 in the warmest sections and May 5 in the Cochrane-Kapuskasing district, but the average date of the last killing frost is a month or more later. In the fall, the northern settlements cannot expect frost-free weather after the first week in September while a comparable date at North Bay, Sudbury, and Fort Frances is September 20. The average precipitation varies from 20.5 to 42.6 in. and fortunately it is heavier in summer than in winter. Serious deficiencies of soil moisture are not frequent. The surplus water is about 6 in. less on the Manitoba than on the Quebec boundary.[5]

The climatic data from stations in the clay belt indicate that the frost-free period averages ninety-four days, and that the growing season is only slightly under two months. During the last thirty years the temperature regime has been generally detrimental to crop growth on an average of one year in two, and destructive to full production about one year in five. Although these statistics must be considered in the light of the fact that very few crops are grown to be matured, most being used as green fodder, the short growing season does keep crop acreages low and thereby raise production cost per acre. Similarly, the late summer maximum of precipitation is often detrimental to crops. Several days of rain and cloud cover, along with low temperatures, may keep grains and hay from ripening or, frequently, wet them to the extent that they cannot be dried prior to partial spoiling. Thus crops may be completely ruined or damaged sufficiently to reduce their value considerably.

Apart from their obvious locational relations and the species limitation imposed by the Boreal type of climate, tree species reflect the character of the drainage. The

area is dominated by black spruce, the principal pulpwood of Ontario, which occurs in pure stands on most of the lower areas. With a moderate rise in elevation to drier sites, the forest composition changes from pure spruce to a mixture of poplar, white birch, black and white spruce, and balsam fir. There are three important exceptions to this mixed forest: pure jack pine on very dry sandy or rocky sites; pure poplar on tills; and a tamarack–black spruce association in the muskegs. The jackpine and poplar stands usually originate after forest fires.

It should be noted that governmental policy in Ontario has been to retain forest land in public ownership, leasing to operators for varying lengths of time, the right to cut and remove timber from the public domain. In the clay belt, large areas of potentially arable land have been kept from settlement where woodland is leased on a long-term basis to major pulp and paper interests. Thus, in effect, farming is restricted to a narrow band along the principal highways, although agriculture has no need for more land, because, as will be indicated below, forestry is the logical use for most of the land in the clay belt.

AGRICULTURAL SETTLEMENT

As early as 1856 the Commissioner of Crown Lands for the Province of Canada stated that in the whole settled area of the country (the St. Lawrence–southern Great Lakes region), little good land remained available for agriculture.[6] This concern eventually led in 1901 to a reconnaissance survey of the then unsettled clay belt to determine its agricultural potential. The resulting report stated that there were large tracts of arable land, extensive tracts of merchantable timber, and deposits of mineral wealth in northern Ontario.[7] As a consequence, between 1902 and 1905 the Ontario government built the Temiskaming and Northern Ontario Railway to New Liskeard, and in 1908 extended it to Cochrane; the Grand Trunk Pacific (now Canadian National Railways) completed its northern span between 1911 and 1914; and in 1913 the National Transcontinental, through Cochrane from Quebec City, was finished. Settlement followed almost immediately, the Cochrane area being surveyed in 1908, and in the characteristic optimism of the times being visualized as the "Winnipeg" of northern Ontario. The Northern Development Branch of the Department of Highways concentrated first on building main roads into the clay belt and then opening up concession roads as development progressed. In part because of the widespread publicity given to the spacious northland, settlers came north at a rapid pace. By 1915 the areas immediately around Cochrane and Matheson were occupied by farmers, and more concession roads, following a zone close to the railway, were hewn out of the forest in short order. Kapuskasing, which originated as a "prisoner of war" camp during World War I, received its first settlers in 1915 but land sales in that area were few until 1921 and 1922.[8]

In this early period of settlement, although the government of Ontario actively encouraged people to become farmers in the clay belt, it was without any definite land-settlement policy. Rather, prior to 1936 individual land selection prevailed so that many lots were alienated regardless of the distance from a travelled road. Many "farmers" picked lots only with the idea of cutting timber, and therefore they made only a few haphazard land improvements to meet the minimum government

standards for occupation. Subsequently, when the timber was removed, or the best of it, such lots were abandoned, the "farmers" then moving on to secure a profit on other lots elsewhere. As a result, concession roads frequently were built into areas where land abandonment soon followed the completion of the road. On the other hand, many settlers managed to clear land, build dwellings, and procure stock, all by means of the sale of timber, or of settlers' loans and seed grain liens.

During the war years, 1914 to 1918, when numerous settlers left the clay belt to enlist in the armed forces or to engage in war work, much stock was sold and farm improvements allowed to deteriorate. To alleviate this problem, a system of farm relief was instituted in 1916; it was based primarily on the amount of stock a man possessed—the more stock he owned, the smaller the subsidy he received—obviously a policy intended to support the smaller farms. After the war, settlement again began to grow because of the Soldier-Sailor Settlement Agreement, through which veterans were granted 160 acres of land in the clay belt and paid their moving expenses to the property.

During the twenties, the prices for timber were high, resulting in a second period of timber stripping and subsequent abandonment of newly alienated land by pseudo-farmers. By 1925, in an attempt to curtail this form of "mining," lots were split so that a settler could locate only on seventy-seven or eighty acres and, until he had fifty of these under cultivation, could not obtain more Crown land.[9] The official reason given for this change in policy was that, because the clay belt was flat and free of stones, only one-half as much cultivable area was required as in the rest of the province.

During the great depression of the 1930's, a co-operative scheme was arranged between the Dominion government, the provincial government, and certain southern municipalities, through which financial aid was given to unemployed men in the depressed areas of the south if they would settle on farms in the north. Under this plan, the Relief Land Settlement Scheme, the two senior levels of government and the municipality from which the settler came, each contributed $200, the total $600 grant being used for transportation, land purchase, building, and equipment.[10] Although applicants for this aid were screened by a board representing the three governments, a large number of the settlers who subsequently located under the scheme were not farmers, and could not cope successfully with the harsh northern environment. Some apparently had a limited knowledge of farming in southern Ontario but had no idea of how to farm in the clay belt; many had experience only on cleared land and did not take into account the fact that most of the land in the clay belt had to be cleared prior to cultivation; others had absolutely no knowledge of farming or even of how to cut pulpwood. Thus, although the well-meaning Settlement Scheme induced many new men into the north, its success as a permanent farming venture was extremely limited.

Until 1961 (at which time Crown land in the clay belt was temporarily withdrawn from sale pending the completion of a re-examination of government policy on land sales) settlers could obtain Crown land for farming anywhere in northern Ontario at 50 cents an acre and by adherence to the Public Lands Act (1936). Since then, however, Crown land has been available only under a scheme which sells the land according to its value and under a more rigid selection of applicants.[11]

If an applicant is approved, a hundred acres may be rented for a period of five years at an annual rental fee of 50 cents per acre. If by the end of this period he shows satisfactory progress towards establishing himself as a full-time farmer, he may then purchase the land at not less than the minimum market price. The latter is currently $2.00 per acre, plus the value of all forest products on the land and of any improvements existing at the date of the first rental. This policy has drastically reduced the number of new farmers purchasing Crown land; there have been only five since 1961.[12]

Although the rather weak governmental policies governing agricultural settlement of the clay belt in the past—much encouragement but little capital—did little for the settler except to provide him with cheap land, an assessment of the present agricultural potential of the area indicates that this approach was in the end unwittingly wise. By way of contrast, one may look at Quebec's portion of the Great Clay Belt in which a rural population is being maintained at public expense on an insufficient economic base, whereas Ontario, mainly because of its initial policies of neglect, is not now faced with the subsidization of an area which has a very limited agricultural potential.

CONTEMPORARY AGRICULTURE

The most obvious feature of agriculture in the clay belt is the lack of a regional pattern. Although the climate permits the utilization of cropland for hay, pasture, and small grains, it prohibits the production of cash crops on any large scale. Thus, farming in the clay belt has been limited to dairying, mixed farming, and a small number of specialized farms. At present, full-time farmers constitute less than one-eighth of the total number of farmers.

Fluid milk producers are engaged in the most profitable farm activity and more or less surround four urban centres—Timmins, Cochrane, Kapuskasing, and Hearst. Milk prices in the clay belt are the highest in the province, ranging from $5.85 a hundredweight at Hearst to $5.25 at Matheson.[13] Dairy farms which do not hold fluid milk contracts are forced to produce cream—an operation which earns only $3.00 a hundredweight of milk. Although the revenue from dairy products has averaged only $900,000 annually over the past six years, this figure constitutes about 60 per cent of the total revenue derived from agriculture in the clay belt.[14] Nevertheless, the production of fluid milk is limited by two major factors. First, because the small local population severely limits the market, the number of farmers with milk contracts is likewise small. For example, the dairies at Hearst are supplied by thirty farms, at Kapuskasing by twenty, at Cochrane by thirteen, at Timmins by fifteen, and at Matheson by only three. Secondly, fluid milk transport costs are, in general, too high to make the movement of milk to the south profitable. In fact, production costs themselves are high because of the expense of concentrate feeds and a winter feed period which is six weeks longer than in southern Ontario. The "flow" of milk is therefore from south to north.

Mixed farming varies within a limited range. Hay dominates, oats and potatoes being the only other common crops. Some farmers grow vegetables for their own use, and in the southern clay belt they usually have dairy cattle and keep some

sheep; beef cattle are scattered throughout the clay belt in herds generally ranging from ten to fifteen head. At Val Gagne, turkey production is an exception to this general pattern. The majority of the mixed farms are small and operate at a bare subsistence level—equipment and buildings usually being in poor condition—because of a lack of capital and the unavailability of farm labour.

There are only four specialized farming operations in the whole clay belt. At Timmins there is a twenty-five-acre vegetable farm, growing cabbages, raspberries, strawberries, carrots, and beets in peat; the sole poultry farm in the clay belt is located at Moonbeam where 6,000 hens produce eggs for the Kapuskasing area; and two potato farms, each about thirty-five acres in size, sell mainly to their local markets of Timmins and Cochrane, although part of each year's potato crop is sold as seed in southern Ontario. The lack of labour during the harvesting season plagues this latter type of enterprise and threatens to force both farms to reduce their acreages.

As in the past, the majority of farmers in the clay belt operate on a part-time basis because, generally, they have found that they could not derive a satisfactory living solely from agriculture. For some, their non-farm occupations are a means to certain farm benefits or to obtain a small income; for others, they are an intermediate step in a complete departure from farming. However, as a result of this method of operation, farms usually are in a run-down condition; for instance, hay is often cut and baled but never used because the farmers have not had time to bring it in from the field before it is ruined by the late summer rain.

AGRICULTURE MARKETS AND TRANSPORTATION COSTS

The local market for agriculture products is both small and scattered. Also, because there is no dominant city to act as a service centre, the clay belt is serviced from outside, chiefly from the Toronto area by means of the overnight highway and railway connections. Local agricultural products therefore have a very limited selling potential. Furthermore, farmers experience extreme difficulty in moving into local markets. Poultry and vegetable farmers may sell locally only if their products are available in quantity, because the chain stores prefer the more reliable volumes and the more uniform quality of goods bought centrally in the south. For example, the manager of the Val Gagne Farmers Co-operative estimates that 90 per cent of the eggs consumed locally are imported.[15] Thus, the cheaper production costs in southern Ontario are detrimental to a northern farmer who raises poultry or vegetables.

The marketing of local crops is also affected by the shortness of the growing season. Because all crops must be planted about the same time, virtually all harvests reach the market together. Also, because most farmers operate on a small scale and therefore lack storage space, they must sell their crops immediately at the lowest market price.

Costs for transporting clay belt agricultural products to outside markets are too high to become competitive with other areas. Nor do these high transport charges encourage specialized production for local markets. Because very little food processing is done in the clay belt, residents must pay transportation costs on their

raw products shipped out and on their processed foods shipped in. The situation of the potato growers illustrates the effect of transportation rates: although the clay belt can produce potatoes if protected from high transport costs, it is estimated that thirty-two times as many potatoes come north as go south.[16] Furthermore, potato growers in the clay belt have made little use of the provincial freight assistance policy on seed potatoes. The freight charge on table potatoes from Cochrane to Toronto is 98 cents per 100 pounds, while from the maritimes to Toronto an agreed charge of 66 cents prevails. Moreover, potato growers are handicapped by small freight volumes of seed potatoes, too small to make it profitable for the railway to negotiate agreed charges.

FARM ABANDONMENT

Agriculture in the clay belt is in a process of adjustment from relatively unattractive on-farm opportunities to relatively attractive off-farm ones (Table I). In 1961

TABLE I
FARM ABANDONMENT
(1961 as percentage of 1951)

	Improved farmland	Number of farms
Southern Ontario	97	74
Northern Ontario (excluding clay belt)	84	54
Cochrane Clay Belt	67	41
Quebec Clay Belt	93	49

there were 900 farms in the clay belt—41 per cent of the 1951 number. However, because a change in the census definition of the term "farm" exaggerates this decline, perhaps a more significant index is the decrease in improved farmland to 124,489 acres in 1961 or 67 per cent of the 1951 total. Although this trend has been prevalent throughout the province, Table I shows that it has been more extreme in the clay belt than in the two major regions of Ontario. Even more interesting is the difference in the rates of decline between the Ontario clay belt and the Quebec clay belt—the former an area of a laissez-faire policy, and the latter of government subsidization.

Farm abandonment is likely to continue, mainly because, for labour, agriculture is in direct competition with mining and forestry. A miner may earn $15–$20 a day, a man cutting pulp $25 per day, and a worker in the mill at Kapuskasing $2.20 an hour as a basic wage.[17] High wages such as these not only attract a large number of owners away from their farms, but also make hired help practically non-existent. In addition, the area around Matheson loses potential farmers because salaried work is available at the sixteen local mines, at the R.C.A.F. Station, Ramore, and at the Bell Telephone television tower; employment opportunities in the town of Cochrane have completely voided that area of full-time farmers except for those twelve who have milk contracts; Kapuskasing with its large pulp and paper operations sustains the whole labour force from Smooth Rock Falls to Hearst; and in Timmins and Porquis Junction many farmers have been drawn into the mining industry. Farm

abandonment also ensues when the older farmers die, for although the family may use the farmhouse as a rural residence, actual farming ceases and the sons seek higher standards of living in employment elsewhere.

THE FUTURE

The future of agriculture in the clay belt appears very limited, not because of the climatic hazards as much as for reasons of economics. At present, Canadian agricultural output is capable of feeding a much larger population than it does, that is, without using the clay belt to any significant extent. For instance, it is roughly estimated that Ontario's agricultural land has decreased by approximately 200,000 acres since 1961, but that at the same time the total output of products has considerably increased.

If agriculture is to remain in the clay belt on a full-time basis, it appears that it must take one of three forms—cow-calf operations, dairy farming, or potato farming. There have been many suggestions concerning the feasibility of raising cattle in the clay belt. Until recently, it had been thought that feeder cattle would be ideal for the area, but several farm concerns have investigated the possibility and found the costs of feed and transportation too high to be economical. Now, cow-calf operations are being considered for the region. Because this type of operation does not have the great feed demands of feeder cattle, costs would be lower and most, if not all, the hay and roughage could be supplied locally. Similarly, transport costs to the southern markets would be lower, because the weight being moved is smaller than that of feeder cattle. Thus, it would appear logical that a cow-calf operation would be more economically sound than would a feeder operation, especially when beef fattening at present relies on large quantities of corn—a crop incapable of growth in the north.

The second agricultural possibility is the expansion of dairy farming on a limited scale. Even though dairy farmers in the clay belt are today suffering competition from dehydrated milk brought into the area, the fact that local markets are being partially supplied by fluid milk coming from distances as far as 140 miles to the south is an indication that the full potential of the fluid milk market in the clay belt is not being met by local farmers. On the other hand, dairying is limited to local markets because high production costs eliminate other outlets. At present, dairy farmers in the clay belt fear a suggested provincial milk pool, which would reduce if not eliminate their incomes because of high operational costs.

The third possibility is the growing of seed potatoes. Because of the vigorous northern climate, the seed potatoes grown in the clay belt are a hardy variety, free of disease, and are thus assured a market in southern Ontario and the maritimes. The fact that a higher price is obtained for seed potatoes than for table stock also justifies the production of the former in the clay belt. Furthermore, because over 50 per cent of the area's table potatoes are brought in on the preferential maritime freight rates, there is really no alternative to the growing of seed potatoes. In the future, however, the operation could support only six to ten farms in all.

The future of full-time farming, if there is to be one, will likely occur by these three means, while part-time farming is destined to remain in the clay belt as long

as there are extractive industries in the region. But part-time farming is negligible in terms of future agriculture production.

CONCLUSION

Today, the clay belt has relatively little to show for fifty years of agricultural development. In certain areas, huge acreages of abandoned land indicate that many individual efforts in agriculture have failed. Of the farmers who remain, less than ten can be considered successful full-time farm operators. Weather hazards are probably the most serious handicap, not only prohibiting the production of many cash crops, but also on occasion damaging or destroying the staple crops. In most cases, the lack of, or sheer distance to, markets restrict attempts at crop specialization. A third difficulty, and perhaps the major one, is the human element: for many reasons, few farmers have the knowledge or necessary capital to be successful. All these factors have in the past and will in the future make the clay belt an area of sub-marginal farming. Perhaps a former Prime Minister of Canada had the clay belt in mind when he said: "I am convinced that some of the land in Eastern Canada that hardworking Canadians are trying to use as farms should go back to forest and water conservation uses and those attempting to live on them resettled in more rewarding surroundings."[18]

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