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COLONIALISM AND THE TRUNCATION OF SCIENCE
 IN IRELAND AND FRENCH CANADA
 DURING THE NINETEENTH CENTURY

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INTRODUCTION

In recent years historians have begun attacking the problem of the development of science in colonial societies. It is clear from studies of American colonial science and, to a lesser extent, from those on Canadian science, that the evolution diverges from the path of that in the metropolitan country. Science does not pick up in colonial states where it leaves off in the mother country, but must pass through a series of stages to emerge as a fully-mature national science, i.e. a science with a community and a set of priorities that is distinguishable from that of other nations. The two North American societies -- the United States and Canada -- have similar scientific histories, in that they passed through similar stages of growth. Nevertheless, significant differences such as relative populations, sizes of industrial bases, and cultural outlook of the respective societies, led to differences in the science of the two nations today. These histories have much in common because both countries had to break colonial bonds -- political, economic, psychological -- to mature.¹ As such, both societies are classic examples of straightforward colonialism: the metropolitan nation, Britain, not only peopled the two colonies but, for an extended period, retained hold on the political and economic lives of the colonies. That the United States broke this bond quickly and decisively while Canada slipped these bonds more gradually changes their respective chronological passages through the stages, yet both countries, while 'Americanizing' their scientific cultures, carried on British traditions and outlooks in no small way since the majority population was British. Other European minorities, such as the Germans, Dutch or Swedes, were generally assimilated into the Anglo-American or Anglo-Canadian cultures.

If the story were this simple, then the historian would only face issues of stages of growth and try to identify the factors that led to the changes. We could construct models of how British science was transferred to the colonies and what became of it in a colonial context. If, by British science, we mean science practiced by the English, lowland Scots and

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Anglo-Irish, and if the colonial context is limited to English-speaking North Americans, then our problem may be attacked in a direct manner. There are, however, two substantial groups that do not fit the model and cannot be ignored: these groups were the native Irish, some six million strong before the Famine, and the French Canadians, numbering some 800,000 by 1851. The burgeoning growth of science and technology during the 19th century seems to have largely passed these two groups by. A list of 19th-century native Irish and French-Canadian scientists is embarrassingly small, yet these two social entities were integral parts of the United Kingdom and Canada, respectively, both of which fully embraced science and technology.

It is evident that a simple model of colonial science is inadequate. Let us note, though, that there is another form of colonialism that has been called 'internal colonialism' by some sociologists. In this form, the colonizing metropolis controls an indigenous society different from its own. This is effected by placing colonists in the colonized country. It is they who control the native population for the metropolis. This, then, is a two-tiered colonialism because the colonists themselves are set in a colonial role vis-à-vis the metropolis. Two examples of this are found in the situations of Ireland and French-speaking Canada. In the former instance, the native Irish population -- often termed Celtic although they were, in fact, already racially mixed -- lost its political independence to England in the middle ages but was not brought under full control until the reign of Henry VIII. His heirs began the sporadic policy of planting English and Scottish settlers a century later. The native population, Roman Catholic in religion, Irish-speaking and culturally distinctive, was effectively disenfranchised during the rise of parliamentary power. London established control over Irish internal affairs, through local government fully in the hands of the families of settlers (the so-called Anglo-Irish) who were Protestant, English-speaking, and more prosperous by far than the native population. This group managed to gain a parliament of its own in Dublin and a considerable degree of autonomy late in the 18th century, but the Act of Union of 1800 put an end to the movement by transferring control to the Parliament of Westminster. Irish nationalism of the 19th century, culminating in the establishment of the Irish Free State in 1921, was, significantly, led chiefly by Anglo-Irish nationalists, not native Irish. Of course, the Anglo-Irish saw themselves as native Irish as opposed to the English, but that they were quite distinct from the indigenous population there can be no doubt. Catholic Emancipation in 1829 and nationalist movements did not lead to a Catholic ascendancy for many years, so firmly did the Anglo-Irish minority grip the levers of power.

The other example, rich in parallels, is that of French Canada. Here again was an already-established society, although in this case one that was colonial in the simpler sense, with an indigenous population possessed of its own language, culture and Roman Catholic religion. The British won Canada through invasion and the Treaty of Paris; they had conquered Ireland through the private enterprise of Anglo-Norman barons. The facts differ but not the ensuing processes. In New France the British moved in not only with a colonial administration but also with immigrants from the metropolis and the American colonies. This new group, never as large as the native francophone population, effectively controlled the country for London. This control was both economic and political. One might expect that the evolution of nationalism in Ireland and in what became Québec would follow similar paths since both were internally colonized. There were, however, some important differences in the situations of the two colonies, differences that meant that the colonized groups would develop at different rates. One fundamental difference was the British policy to allow French Canadians more political activity and not to suppress the Roman Catholic Church. This was an anomaly in the British Empire but a political necessity in the face of growing American discontent that led to Revolution.

Another fundamental difference was the fate of the original inhabitants' language. In Canada, the British immigrants made only weak and occasional attempts to assimilate the French-speaking population in Québec, and the maintenance of the French language became an article of faith, a part of nationalism. In Ireland, the loss of the Irish language, effected by the educational system, meant that the maintenance of cultural individuality rested upon other characteristics and came to be associated with the Church, family life and general culture (especially literature and music).

A description of science in Ireland and in French Canada during the 19th century would likewise show differences, but more striking are the similarities. To simplify the comparison I will restrict the study in Canada to the area now encompassed by the Province of Québec. The area which we are concerned with became a distinct political unit with the Canada Act of 1791, which created the Province of Lower Canada, so styled until Confederation in 1867. Although the French-speaking population outnumbered the English-speaking by ten to one in Lower Canada, the anglophone group retained significant control despite the allowance of the older French land tenure forms, laws, customs and education.² Within that culture there was no strong tradition of science. The few interested in the flora, fauna and natural productions of the country were almost all French officers, government officials and missionaries.³ The small middle class showed little interest in general culture and there were no societies, no printing presses, no museums,

no public libraries. One must remember, however, that the population was small -- not more than 60,000 in all French America in 1760 -- and the towns of Québec, Trois-Rivières and Montréal were much smaller in comparison with the active American centres of Boston, New York and Philadelphia. Only after the British arrived did the population of town and countryside grow rapidly.

The case of Ireland is even more clear-cut. The tradition of science goes back to the 17th century, but it is an Anglo-Irish tradition. The very few cases of Roman Catholic scientists, such as Richard Kirwan, are simply isolated cases of people integrated into the dominant culture.⁴ There are several ways to show the scientific part of culture was truncated in internally-colonized societies, and for this study I want to concentrate on two: scientific societies and scientific education.

My explanation of the truncation of science in both Ireland and French Canada is based upon the idea of internal colonialism which created a difference in the development of the ruling and ruled groups. This difference, which can be measured not just economically but also attitudinally, led to inward-looking societies amongst the Roman Catholic Irish and French Canadians. My thesis is that such inward-looking groups could not afford, nor would be inclined, to favour the growth of science as an integral part of culture. It is all too easy to blame the Roman Catholic Church for this attitude, particularly the strong currents of ultramontane Catholicism that were powerful in both countries in the 19th century. European ultramontanism, dedicated to papal supremacy, anti-nationalism, and anti-liberalism, led by Pius IX, had a large impact on the Irish Church. There it became virulently opposed to any liberal tendencies, particularly in education. In French Canada, ultramontanism became identified with French-Canadian nationalism (unlike its European variant). Yet in neither form was it expressly opposed to science in general, only to science where it was linked to obviously non-Catholic currents of thought; however, if a certain liberal frame of mind is required for the cultivation of science, then one could argue that the Church, which had a profound influence on the minds and habits of Irish and French Canadians, would, during its ultramontane phase, actively discourage science as an individual or corporate activity. I do not believe the evidence will show this and, further, I would turn the argument around: a reactionary, powerful ultramontane Church could only hold sway over peoples' opinions *where the social outlook was already receptive for it*, i.e. already strongly conservative and inward looking. Many authors have argued that the Church exerted a strong conservative hold over Québec society until the so-called 'Quiet Revolution' of the 1960s. Are we then to assume that the Church, somehow, 'loosened its grip' over Québec society? No, rather that the social, economic and political development of Québec

had, by the 1960s, reached a point where significant liberalization could take place, thereby changing the environment where a conservative, hierarchical organization could flourish. The ultramontane movement, then, must be seen as a result -- not the cause -- of conservatism in 19th-century Irish and French-Canadian societies. Science would not likely have flourished in either society, with or without ultramontaniam.

SCIENTIFIC SOCIETIES IN THE COLONIAL CONTEXT

Scientific societies have been an important feature of scientific culture since the 17th century, and by the 19th, a hierarchy of different kinds of societies had emerged. At the top was the national honorific society with the dual functions of advancing science through mutual stimulation and in rewarding a scientific élite. In Ireland, this level was filled by the Royal Irish Academy, incorporated in Dublin in 1786 and dedicated, as its charter stated, to the promotion of 'science, polite literature and antiquities.'⁵ Science, as understood by the Academy's members in the 19th century, did not include the applications of science to agriculture or to industry -- although some of its members engaged in practical science. Being elected to the RIA was a signal honour although, once Ireland was part of the United Kingdom, a fellowship in the Royal Society of London may have been more coveted. In Canada there was no comparable organization until 1882, with the foundation of the Royal Society of Canada by Lord Lorne.⁶ That the RIA encompassed literature, history and archaeology, and the Royal Society of Canada included similar studies reflects upon the fact that neither country had a large pool of first-class scientific workers. In Canada, too, there were fellows of the Royal Society of London, but that institution had relatively little impact upon Canadian intellectual life.

On the lower level were those societies with broader aims and fewer restrictions upon membership, although certain restrictions, such as the fees, effectively limited such societies to the upper and middle classes. The British Association for the Advancement of Science, in theory an empire-wide organization, naturally had more Irish than Canadian members for reasons of geography. This society was limited to professional scientists and committed amateurs. In more local terms the Royal Dublin Society had more impact upon Irish life. Incorporated in 1750 as a society for the promotion of 'husbandry and other useful arts in Ireland,'⁷ it differed from the RIA in that its rolls were open to those interested in the society's aims and, in the 19th century, included a considerable number of gentlemen farmers, manufacturers and noblemen as well as scientists. The RDS was centred on County Dublin and, to a lesser extent, on Leinster and could not truly be considered national in its membership despite its pretensions.

Its greatest contribution from the public's point of view was its annual agricultural shows. In Canada, there was no equivalent of the RDS, although the Canadian Institute (1849) in Toronto made claims to being national in outlook.

On a more particular level were local societies catering to general interest such as the Literary and Historical Society of Quebec, Montreal Natural History Society, Natural History Society of New Brunswick, Nova Scotian Institute of Science, etc. in Canada or the Belfast Natural History Society, Cork Institution, etc. in Ireland. Alongside these were societies restricted by subject matter rather than locality, e.g. Entomological Society of Ontario, Royal Geological Society of Ireland, etc. At the bottom were the strictly local groups such as Mechanics' Institutes, literary societies, and science clubs in universities.

The histories of local societies and of those with national pretensions are so stereotyped for the 19th century that one can virtually predict their life cycles given a few facts. Most of these groups formed around a kernel of local amateurs, typically professional men, and if the locale had a university or academy, professors would play leading roles and stimulate flagging interests. The societies usually had brave beginnings with a plethora of offices, complicated constitutions, and overly-optimistic programmes. Initial response was encouraging in most cases, but there can be no doubt that the majority of members of such organizations joined for social reasons rather than from any true dedication to science. There must have been literally hundreds of such groups in the last century, many with plans for mineralogical cabinets, herbaria, museums, instrument collections and botanical gardens, yet the vast majority of them disappeared after a short lifetime. Since the kernels of such societies were so small, the removal or death of one or two key members, or slight economic or social changes in the neighbourhood could be sufficient to end the existence of such organizations. For instance, what became of dozens of Canadian Mechanics' Institutes or the natural history or literary societies of Carrickfergus, Bailieborough, Ballymahon, Portlaw, Strokestown, Lisburn or Limerick?

Undoubtedly, one essential factor was population. If a given locale had too few educated people and no institutional focus, such as a university, to ensure a steady supply of committed members, no local society could prosper for long. Three Irish examples show how these demands must be met. The RDS, Royal Cork Institution, and Belfast Natural History Society were all local in terms of membership, and all survived for considerable periods (the first and last are still active). All three were in the three great Irish cities: in 1861, Dublin, Cork and Belfast had populations of 255,000; 80,000; and 120,000 respectively. Only one other Irish town, Waterford, surpassed 20,000. It

is not surprising that these three societies were the only important local institutions to last for considerable periods. But mere population was not enough. Since such organizations in Ireland were run by and for Anglo-Irish, the Protestant population had to be elevated enough to sustain interest. In the case of the Royal Cork Institution, founded in 1802 by the Presbyterian divine Thomas Dix Hincks⁸ along the lines of the RDS, we find a society in the British tradition which met with great initial success. By 1810, it boasted nearly 200 members, a botanical garden, lecture series and paid professorships in natural history, chemistry, agriculture, and natural philosophy. But Cork, greater than 110,000 before the Famine, had a sizeable Protestant population from which could be drawn men fully in tune with the RDS model and ideology. By 1861, the city had lost nearly 30,000 people, and of those remaining, nearly 85% were Roman Catholic. In short, the Royal Cork Institution was being sustained by the equivalent of a Protestant town of 12,000. Not surprisingly, the organization had nearly faded away.

That the RDS and Belfast Natural History Society remained active can be explained in the same way since the Protestant populations of Dublin and Belfast in 1861 were approximately 59,000 and 79,000 respectively. These statistics are invoked because of the striking degree to which the Protestant Anglo-Irish dominated such groups. The Belfast Natural History Society is an excellent example. Founded in 1821 by Protestant professionals and businessmen,⁹ it automatically excluded the largely Roman Catholic working class (assuming they would have had either time or interest) through an annual fee of 20 s. Making it even more difficult for a Catholic member of the working class or lower middle class to participate was a patronizing class consciousness:

To know that so many, who are toiling in various ways, during the busy hours of the forenoon, may in the evening participate in pleasures, the same in kind, but different in degree, with those which the most eminent in mental achievements enjoy, is a most gratifying reflection.¹⁰

By mid-century, about one third of Belfast's population was Roman Catholic and most of it working class. The membership rolls make it clear that few Catholic Irish of any class belonged to the Society. The most important link between the Society and the public, and a stimulant to public imagination for science, was the museum, begun in 1830. But again there were restrictions: subscribers for the building fund were those who could purchase shares at £7 apiece, and only they had free access to the collections. The public had to pay 1 s., which was out of the question for working class families. In the 1840s, the Society decided

to throw the museum open on Easter for the public at the rate of 2 d. for adults and 1 d. for children. A great success, this was repeated since the working class had come out in great numbers 'without the property sustaining the most trifling injury.'¹¹ This was too little to stimulate Catholic interest in science, and by the end of the century, the Society was still a Protestant preserve.

Scientific societies were, for the most part, urban phenomena with Dublin and Belfast supporting the majority of such institutions. While one might expect a significant difference in the cultivation of science in the more industrialized Ulster, compared with the other provinces, the actual distribution of organizations tended to follow that of active Protestant urban minorities (for example, in 1849 only two of the nine Irish Mechanics' Institutes were in Ulster). This suggests the social element of scientific institutions was as important as the purely intellectual element.

In Canada, a similar phenomenon could be seen, although the French Canadians as a social group were more advanced than the Irish in self-awareness. Nonetheless, when scientific activity did appear, it was initiated by the British population. In Québec, the Literary and Historical Society was founded in 1824 by the Governor-General, Lord Dalhousie.¹² Despite its name, it was at first most active in science and included a few francophones drawn from government and the professions. These few were interested in the sciences but left the production of science to anglophone members, chiefly military officers and local professionals. The interest in science peaked before the Rebellion of 1837, and even then the societal lines were drawn through the formation of a rival society, the Société pour l'encouragement des sciences et des arts au Canada, formed in 1827 by liberal francophones and sympathetic anglophones. In addition, libraries were opened with scientific collections, public lectures in science were initiated, and government expeditions recruited local participants. But the societal division underscored by the Rebellion spelled the end of the LHSQ as a bicultural society with significant scientific activity. In Montréal, we find the Natural History Society, analogous to its Belfast namesake. Created in 1827 by local professionals, it remained throughout the century an anglophone institution with very little French-Canadian participation. When William Dawson resuscitated McGill University after 1855, the Natural History Society became almost an adjunct of the school.

An analysis of the membership lists of the LHSQ and Natural History Society show clearly the low level of francophone involvement. In the LHSQ, one quarter of the society was francophone in 1831 when a Royal Charter was bestowed upon it. By 1836, on the eve of the Rebellion, one quarter of

the officers were still francophone, but the political troubles and subsequent removal of the capital to Kingston signaled the almost total withdrawal of francophones. The revival of the LHSQ in the 1860s and 1870s was an anglophone phenomenon. In Montréal, few French Canadians joined the Natural History Society at any time. Comparing an early membership list from about 1830 with one from the 1870s, we find in the early list some 113 members, only four of which were francophone: two were Montréal physicians, one a corresponding member in Québec, the fourth a Swiss Protestant. This in a city that was at least half French-speaking. In the later list, we count 53 life members (one francophone), 144 ordinary members (five francophones), and 124 corresponding members (seventeen francophones). Altogether, of 320 members in these classes, only 23 were francophone. Of those members actually resident in Montréal, only 3% of the membership was French Canadian. By the 1870s Montréal was largely French-speaking, so the main scientific society did not attract members from the majority community.

Does this mean that there was no interest in science amongst French Canadians? By no means, although that group did not profess nearly the interest in the sciences as their English-speaking neighbours. The pattern for intellectual societies in Québec is one of alignment by linguistic and cultural lines. Since intellectual societies were as much a part of French as British culture, we would have to look at other organizations which must have drawn the francophone intelligentsia and middle class in general. In Québec, where the Société pour l'encouragement lasted only two years before its amalgamation with the LHSQ, returning francophones to an anglophone-dominated organization, an alternative was required. In 1843 Auguste Soulard formed the Société canadienne d'études littéraires et scientifiques which had, amongst other aims, the desire to provide free public lectures.¹⁴ It attracted about forty members but soon collapsed. Its successor was the Institut Canadien de Québec, founded in 1847 by prominent French Canadian politicians and professionals. Within a month of its foundation meeting, it claimed more than 200 members.¹⁵ The Institut was part of a province-wide movement begun with the Institut Canadien de Montréal in 1844; at its peak, the movement had some twenty institutions in Québec and Ontario. The Montréal Institut was formed by young men who felt the lack of decent libraries and places of discussion. In a sense, the Institut Canadien movement was an answer to the Mechanics' Institutes, a British concept which, in Lower Canada, was heavily weighted in favour of middle class anglophones.¹⁶ But the Institut Canadien movement was more, for it espoused not only general cultural and scientific aims, but also nationalism and fraternité. Students of Canadian history know the fate of the Montréal branch, where radical politics aroused clerical ire; the Institut reached its ignoble end with the *affaire Guibord*

in 1869-70. But the Québec Institut, which still survives, was led by liberals of a less fiery sort. Interestingly, most of its principles were almost identical to those of the LHSQ. By the 1880s, the Institut outstripped the LHSQ in size and offered scientific lectures to the public, calling upon Université Laval professors Larue and Laflamme amongst others.

Irish Roman Catholics had political societies that did not dabble in science; the Québécois did dabble but little more. Attempts to form a truly French-Canadian scientific society met with little success even with the backing of the Université Laval. The botanist Ovide Brunet formed a small group in 1870 which soon lapsed. In 1882 a scientific society of Laval professors and students met on occasion, but two years later the abbé Laflamme was thinking of forming a field naturalists club.¹⁷ This grew to be a Société d'études scientifiques de Québec which was to have sections for physical science, zoology, botany, and geology and mineralogy -- again, a Laflamme idea.¹⁸ Finally, in 1887, the Société d'histoire naturelle de Québec was founded with the active participation of the anti-Darwinian botanist and entomologist Léon Provancher, the founder-editor of French Canada's only scientific journal, the *Naturalist Canadien*.¹⁹ Even by the late 1880s, the pool of potential members was still very small.

THE FAILURE OF SCIENTIFIC EDUCATION

A second area of comparison is that of the role of science in higher education. As students of 19th-century education know, science was an essential part of the liberal arts curriculum, but the level at which most of it was taught was elementary. Few institutions offered advanced work, research, or higher degrees in science, nor in applied science when it entered the curriculum during the second half of the century. Science below the university level was minimal and usually restricted to natural history, mathematics and, perhaps, some chemistry. Before the advent of widespread higher education in science, scientists were largely self-taught in their disciplines. Only during the second half of the century did the university emerge as a primary route to the profession of science. In both Ireland and Québec we find relatively mature educational systems which produced scientists, but mostly for the minority, dominant groups.

Irish education was entirely in the hands of the Anglo-Irish ascendancy at the beginning of the century and consisted of a network of state-supported schools whose admitted goal was to anglicize and convert the Irish people. The joint thrusts of Anglo-Irish liberalism and Roman Catholic reaction to existing education brought into being, in 1831, the National System of Education. In theory, the schools -- publicly supported -- were to be non-denominational, but the language of instruction was English.

In practice, individual schools tended to be run by Catholics or Protestants depending upon the makeup of the local population. In terms of anglicizing the population, the national system was an outstanding success: by the end of the century, Irish had virtually ceased to exist as a spoken language. Science and mathematics formed a part of the curriculum and national school manuals were of high calibre, often being adopted in England and Canada. Until mid-century, however, there was only one centre of higher learning for the eight million Irish -- the University of Dublin which consisted only of Trinity College, an Anglican foundation. Trinity was the hub of Irish science: its list of science professors and graduates reads like a *Who's Who* of Irish science. Yet, this list was almost entirely Protestant, Anglo-Irish. It must be explained that Roman Catholics were barred by statute from professorships, scholarships and fellowships at Trinity, although they could attend and some did. The virtual disbarment of native Irishmen from higher education created pressure for reform and the vexatious Irish university question raged into the 20th century. The first solution was to create non-sectarian universities in Belfast, Cork and Galway, an obvious adaptation of the ideal of the National Schools.

The Queen's Colleges were all open by 1850 and, in the case of Cork, with a Roman Catholic scientific figure, Sir Robert Kane, as president. All three schools offered up-to-date science curricula. On paper, the Roman Catholic population now had the means to attain higher education, and a few might be expected to pursue science. In practice, the more reactionary elements of the Church hierarchy, led by John MacHale, Archbishop of Tuam, strongly opposed the whole concept of 'mixed education' which he believed led to 'indifferentism.'²⁰ With MacHale were the archbishop of Cashel and eighteen bishops ranged against the archbishops of Dublin and Armagh and four bishops. So strong was the fear of liberal tendencies of any kind that MacHale's followers ignored Rome's initial temporizing and forbade Catholics to attend the new universities. This policy was not totally successful. Humphrey Lloyd, physicist and Provost of Trinity College, computed the relative proportions of students for 1866-67 and found that of 1573 students matriculated at Trinity and the Queen's Colleges, only 245 were Roman Catholics or, as he put it 'the proportion is accordingly only one-half of what it should be.'²¹ That Lloyd should have thought that 16% of the students ought to be at least elevated to about one third of the total when the country was 78% Catholic is not surprising. We would not expect the Roman Catholic contingent at Trinity -- only 8% in 1866-67 -- to be large, but in the Queen's Colleges, he found that the average Catholic attendance from 1862-71 was about 25%.²²

Since the Queen's Colleges (and their later incarnations) answered so poorly for Catholic higher education and

militated against any significant increase in scientific personnel from that source, an alternative needed to be tried. The extremely conservative hierarchy of the Irish Church was opposed to any secular education. Offering little leadership themselves,²³ they conceived an alternative in the Catholic University, but left its organization to an Englishman: John Henry Newman. Newman almost single-handedly built the Catholic University, but since his brand of Catholicism was already suspect in Ireland, his vision of the university project received only a lukewarm reception. Opening in 1854 in Dublin, the Catholic University was to be fully modern. Although a medical school was attached, he envisioned a university which would ultimately include a faculty of science and a polytechnic institution. He was able to obtain the services of excellent Catholic professors such as William Sullivan, a chemist, but could attract few students. By the time the remnants of the university were absorbed by the Jesuit-run University College, Dublin, in the 1880s, Newman's dream could only be seen as a failure. Any liberal tendencies that might have developed in the university were forestalled by wrangles with the hierarchy, and the views of Newman's successor as rector, Mgr Woodlock, who saw Gallicans, modernists and positivists everywhere.²⁴ Dr Moriarty, writing to Woodlock in 1868, provided the epitaph:

I was full of faith in its future in the beginning, but as soon as I came to know the conditions of our people I began to despond. You had all the conditions of success except one viz. a *materia circa quam*. I see no one wanting that University Education you want to give. We want good schools and then professional education. From the very start I thought Newman aimed too high. . .²⁵

Of course, 'good schools' meant Catholic schools, not the pernicious mixed National Schools. Good education was not lacking for the native population, just the *will* to succeed in higher studies.

In French Canada the question of higher education was at least superficially the reverse of the Irish. The British authorities, apart from banning the Jesuits from teaching in Canada, had allowed the few Catholic schools to reopen after the Conquest. At the head of these was the Séminaire de Québec, heir to the Jesuit Collège de Québec. The Séminaire was joined by dozens of other *collèges classiques* during the century and these, following the lead of French classical education, offered two years of instruction in mathematics and the sciences -- the philosophy classes.²⁶ The anglicizing and conversion of the French Canadians, the dream of some of the anglophone newcomers, did not materialize and the Québec Church retained a firm hold on education.

Allowing Catholic education was, for the British a *quid pro quo* for maintaining the allegiance of the francophones. This policy, together with the British lack of policy for anglophone schools, ensured that, by the time of the *Durham Report*, French-Canadian education was of a higher calibre and more widespread than that of English-speaking Canadians in Québec. Like Ireland, however, Québec had only one university in the first half of the century -- McGill University -- an anglophone, Protestant-dominated school. It was practically moribund until 1855 when John William Dawson became Principal. It developed into Canada's foremost scientific school by the end of the century and, like Trinity College, Dublin, did attract a few Roman Catholics of the majority.

The education offered by the Séminaire de Québec and other classical colleges, if completed, was the virtual equivalent to the baccalaureate in English-Canadian schools (at least until the rise of organized honours and specialist degrees) but none of these institutions could grant degrees. The Séminaire, oldest and probably best of these schools, decided to fill the void through the erection of a Catholic university. The Université Laval opened in 1852, the designated capstone to the system of classical education. It would grant degrees to those who completed the classical course in any of the lower schools and offer instruction in the last years of the course. While the number of students enrolled in the schools was considerable, few finished the rigorous programme of studies. What this meant was that few became exposed to much science.²⁷ The university council realized that the formation of professionals would require further instruction and hoped that a programme in the arts and sciences leading to a master's degree or *licence* could be implemented. Laval received the same response as Newman's Catholic University: no students. Between 1857 and 1899, the university granted 98 master's degrees and one *licence ès sciences*, and not one was an earned degree. Faced with no students, the university decided that all professors in the classical colleges who taught the course in philosophy would obtain the degree automatically. Since the Faculty of Arts did not truly exist until the 20th century, the professors at Laval spent their time instructing students on the lower level. It must be pointed out that the faculties of law, medicine and divinity flourished at Laval. There was clearly no attraction in a scientific career amongst French Canadians.

If we draw up a list of scientific figures in 19th-century Ireland and Québec, we find amongst them few who came from the majority populations. Yet by mid-century, both countries were well provided with elementary education and, a little later, with ample higher education. Where were the promising young men? First, in a situation where a social group feels inferior and, in internally colonized Québec and Ireland, these feelings were certainly felt, an individual is likely to choose the surest path to respectability. Not all paths

were open; the late 18th-century restrictions on both Roman Catholic Irish and French Canadians limiting or closing access to military or high official careers created no strong tradition of seeking those occupations. Once restrictions were lifted, there was, apart from a few notable examples, little enthusiasm amongst the better-educated or upwardly-mobile to pursue such careers. Furthermore, the children of these two groups were actively discouraged from entering Protestant universities. Both societies were essentially rural so that, to attain respectability and a higher social station, the youth of the country chose the liberal professions. These positions were not sinecures, the poverty of young doctors or lawyers being a familiar story. The Church in both societies bid for the best of the youth. Statistics bear out that the liberal professions -- especially medicine and law -- were far more popular than science or engineering. At the Université Laval, the arts faculty failed to attract anyone, but law and medicine boomed; from 1853 to 1899, the university graduated 968 men with either a licenciante or doctorate in medicine, and 156 licenciates in law, in sum more than 1000 professionals compared with no science graduates.²⁸ In addition to these, a smaller number graduated from McGill. In Ireland, too, the liberal professions and Church were the route to respectability. The census of 1864 showed that, of 6482 members of the liberal professions in Ireland, 2219 were Roman Catholic, more than one-third of the total, which may be compared with the 18% attendance at universities by Catholics.²⁹

CONCLUSIONS

On a higher level, a corporate sense of the importance of science and the advantages of a scientific career could be entertained by only a section of society attuned to the progressive outlook of Victorian England, i.e. favourable to industrialization, secularization, expanded educational opportunities, etc. This was to be a stumbling block for the internally-colonized peoples. English Canadians and Anglo-Irishmen could and did adopt these liberal values, but their opposite numbers in the professions were attracted to a truncated form of liberal thought, one that often had its outlet in nationalist movements. These movements naturally employed those occupations of use to it such as journalism, the arts, and law. Science and engineering were of no conceivable use. Not all nationalist movements were liberal: in Québec, the Société de St-Jean-Baptiste could not be confused with the Institut canadien, nor could the conservative nationalism of Archbishop MacHale in Ireland be confused with the radical nationalism of Young Ireland. But to press for industrialization and its concomitant, science, was unthinkable for conservative groups and rare for liberal ones.³⁰

Neither Ireland nor Québec offer examples of simple colonialism; the whole nature of their struggles are different from those colonies whose populations are extensions of the metropolitan nation. Thus, the adoption of science as a legitimate social activity by a group which is internally colonized is a more difficult matter. Even if science were already a socially-acceptable part of culture, it is bound to be, for a time, truncated. The psychological pressures in a colonial context of this kind are such that the energies of the very people required for science are attracted elsewhere. That even today the social structure of science and the relative number of scientists in Ireland and Québec differ from those of England and English Canada, respectively, indicate how long the effects of internal colonialism survive.

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NOTES

1. Studies of colonialism are legion; the key work for 'scientific colonialism' is George Basalla, 'The Spread of Western Science,' *Science*, 156, 1967, 611-22.
2. See Fernand Ouellet, *Lower Canada 1791-1840. Social Change and Nationalism* (Toronto, 1980), and *Histoire économique et sociale du Québec, 1760-1850* (Montréal, 1971).
3. Léon Lortie, 'La Trame scientifique de l'histoire du Canada,' in G.F.G. Stanley, ed., *Pioneers of Canadian Science* (Toronto, 1966), 3-35; T. H. Levere and R. A. Jarrell, eds., *A Curious Field-Book: Science and Society in Canadian History* (Toronto, 1974), 2-7, 25-41.
4. The period before the founding of the Royal Dublin Society is covered by K. T. Hoppen, *The Common Scientist in the Seventeenth Century: A Study of the Dublin Philosophical Society 1683-1708* (Charlottesville, Va., 1970).
5. Royal Irish Academy, *Report of the Council* (Dublin, 1883), 4. There is no adequate history of the RIA; a recent sketch is *The Royal Irish Academy and its Library--A Brief Description* (1964).
6. Robert Daley and Paul Dufour, 'Creating a "Northern Minerva": John William Dawson and the Royal Society of Canada,' *HSTC Bulletin*, 5, 1980, 3-13, but cf. P. J. Bowler, 'The Early History of Scientific Societies in

Canada,' in A. Oleson and S. Brown, eds., *The Pursuit of Knowledge in the Early American Republic* (Baltimore, 1978), 326-39.

7. See Henry F. Berry, *A History of the Royal Dublin Society* (London, 1915).
8. Hincks (1767-1857), a leading scientific figure and organizer in both Cork and Belfast, also had connections with Canada through two of his sons, William -- Professor of Natural History at Toronto -- and Sir Francis -- Liberal government leader. A brief overview of the Royal Cork Institution is given in the 'Memorial of the Royal Cork Institution to Earl de Grey,' Trinity College Archives, 7762-72, #902.
9. Arthur Deane, ed., *The Belfast Natural History and Philosophical Society. Centenary Volume, 1821-1921* (Belfast, 1924).
10. *Belfast News-Letter*, 22 January 1839.
11. 'To the Working Classes,' (handbill), Public Record Office of Northern Ireland, D.3263/E/1.
12. See *The Centenary Volume of the Literary and Historical Society of Quebec* (Québec, 1924). Consult, also, Richard A. Jarrell, 'The Rise and Decline of Science at Quebec, 1824-1844,' *Histoire sociale*, 9, May 1977, 77-91.
13. A number of lists of members and councillors of the society are in the papers of the Natural History Society of Montreal, Blacker-Wood Library, McGill University.
14. *Statuts de la Société Canadienne d'études littéraires et scientifiques fondé à Québec le 4 octobre 1843 à l'avenir de la Patrie* (Québec, 1843).
15. Jean Bruchési, 'L'Institut canadien de Québec,' *Cahiers des Dix*, 12, 1947, 96-7.
16. The Mechanics' Institute in Québec, for example, was formed in 1830 and enrolled more than 150 in its early years. In 1836, however, only one of its eleven officers was a francophone. Amongst the others were notable Québec anglophones such as John Neilson, Joseph Morrin and Dominick Daly.
17. Henri-Marc Ami à J.-C.-K. Laflamme, 1884. Archives du Séminaire de Québec (ASQ), Université 60, No. 1.
18. 'Société d'études scientifiques de Québec,' ASQ, Université 64, No

19. Léon Provancher à T.-E. Hamel, 6 mai 1887. ASQ, Séminaire 81, No 735.
20. John MacHale and William O'Higgins, *Brief Remarks on the System of Mixed Education which is Sought to be Established in the so-called Queen's Colleges in Ireland* (Rome, 1848; Dublin, 1849).
21. Humphrey Lloyd Papers, Trinity College Archives, 1937a, f. 3r.
22. *Ibid.*, f. 32r.
23. Catholic higher education at the time was limited to seminaries preparing young men for the priesthood. The best of these was probably Maynooth College in Maynooth, County Kildare. Science was part of the curriculum as it was in the French-Canadian séminaires. One of the few notable Catholic scientists of the 19th century, physicist Nicholas Callan, taught there from 1826-64. See John Healy, *Maynooth College. Its Centenary History* (Dublin, 1895).
24. Very Rev. Mgr. Woodlock, *Educational Dangers: or, on the Future of Ireland* (Dublin, 1868).
25. Moriarty to Woodlock, 23 July 1868. Quoted by Fergal McGrath, *Newman's University. Idea and Reality* (Dublin, 1951), 504-5.
26. The best survey of classical education is Claude Galarneau, *Les Collèges classiques au Canada français (1620-1970)* (Montréal, 1978).
27. Galarneau provides some statistics. At the Séminaire de Québec, between 1824 and 1863, 20% finished the full course. At Nicolet, where science was particularly well-taught, the 1863-1935 figure is also 20%. In Montréal, this figure could be half that in the early years of the century. Galarneau, *Ibid.*, 159 n.33. A typical philosophy class at the Séminaire rarely exceeded a dozen.
28. Université Laval, *Annuaire 1900-01*.
29. Humphrey Lloyd Papers, Trinity Collegè Archives, 1937a, f. lv.
30. Of course, not all members of the majority were opposed to industrialization. The provincial government of P.-J.-O. Chauveau was particularly eager to expand industrially and aid education to that end. Daniel O'Connell, leader of the Catholic Emancipation movement, though conservative in many respects, understood the

importance of industry. Perhaps the ultimate example amongst the Irish Catholics was Sir Robert Kane, president of Queen's College, Cork, longtime director of the Museum of Irish Industry, and author of an influential book on Irish industry.